INSTITUTO NACIONAL DE PESQUISAS DA AMAZÔNIA

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DO
MUSEU PARAENSE EMILIO GOELDI

TOMO XI — FASCÍCULO I

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Por um convênio realizado em 7 de dezembro de 1954, entre o Estado do Pará e o Instituto Nacional de Pesquisas da Amazônia, foi a direção científica e a administração do Museu Paraense Emílio Goeldi entregue a êsse órgão a partir de 1.º de Janeiro de 1955, pelo espaço de 20 anos.

O Museu Paraense Emílio Goeldi continuará a pertencer ao Estado do Pará, recebendo o Instituto Nacional de Pesquisas da Amazônia todo o seu acêrvo, que administrará com ampla e total autonomia, sem, entretanto, poder alienar qualquer parcela de seu patrimônio. Construções e benfeitorias que forem feitas nos terrenos e prédios do Museu, nesse período, passarão a constituir seu patrimônio.

Todo o pessoal do Museu Paraense Emílio Goeldi passa a ser de livre escolha do Diretor do Instituto Nacional de Pesquisas da Amazônia, obedecido o disposto nos decretos federais n.º 31.672, de 29 de outubro de 1952 e n.º 35.133, de 1.º de março de 1954, que, respectivamente, criaram e regulamentaram o funcionamento do Instituto. Os servidores do Museu que não forem aproveitados em sua nova organização, ficarão à disposição do Govêrno do Estado.

Deverá o Instituto Nacional de Pesquisas da Amazônia promover o reequipamento do Museu Paraense Emílio Goeldi, restaurar suas instalações, atualizar sua biblioteca e dotar o mesmo com um quadro de especialistas nacionais ou estrangeiros à altura da elevada missão de continuar a obra com tanto brilho realizada por seus antecessores.

Dois anos antes de findo o prazo do convênio, poderá êste ser denunciado por qualquer das partes, em caso contrário sendo considerado automàticamente prorrogado por períodos sucessivos de cinco anos, sempre que não seja denunciado com dois anos de antecedência.

Denunciado o convênio e findo o prazo de sua vigência, passarão para o Govêrno do Estado do Pará a responsabilidade da administração do Museu Paraense Emílio Goeldi, bem como os respectivos encargos relativos a pessoal e material, inclusive os resultantes de contratos, acôrdos ou convênios assinados pela administração do Instituto Nacional de Pesquisas da Amazônia.

O Museu Paraense Emílio Goeldi continuará, através de seus técnicos e cientistas de outras instituições a contribuir para o estudo das ciências naturais na região Amazônica, mantendo, assim, a sua tradição e área de ação.

O Boletim será mantido sob o formato anterior e publicará trabalhos também em línguas estrangeiras quando o âmbito ou natureza puramente técnica do trabalho assim o exigir.

REVISÃO DO COMPLEXO CYRTORHINUS *FIEBER* — MECOMMA *FIEBER (HEMIPTERA-HETEROPTERA, MIRIDAE)*

Por

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INTRODUÇÃO

Os percevejos de plantas ou mirídios incluídos no complexo acima apresentam grande interêsse econômico e taxonômico. Algumas espécies são utilizadas no contrôle biológico de cigarrinhas (homópteros) nas Ilhas do Pacífico e encontram-se, no momento, em estado de confusão taxonômica.

Atualmente estão incluídas no complexo espécies pertencentes a duas subfamílias diferentes, Orthotylinae e Phylinae, fàcilmente separáveis pela presença ou ausência de verdadeiros arólios entre as unhas.

Nossos estudos mostram que Fieber estava certo quando estabeleceu, em 1864, o gênero Tytthus *para abranger duas espécies sem arólios, os quais se acham substituídos por pêlos entre as unhas. Assim sendo, tôdas as espécies do complexo com êste e outros caracteres dos Phylinae deverão passar ao gênero* Tytthus, *embora autores recentes, não reconhecendo a importância das unhas, hajam colocado as mesmas em* Cyrtorhinus *(Orthotylinae). Algumas espécies dêste último gênero deverão ser transferidas para* Mecomma, *que continua sendo mantido como gênero independente. Um gênero novo,* Fieberocapsus, *é proposto para a espécie* flaveolus *Reuter.*

Essa confusão existente entre entomólogos experimentados resulta do fato de serem as espécies dêsse complexo, embora pertencentes a subfamílias diferentes, muito semelhantes entre si e com os mesmos hábitos e habitats, *constituindo, assim, um caso de acentuada e curiosa convergência.*

CONTENTS

INTRODUCTION

The Mirid bugs in this complex are of both economic and taxonomic interest; for not only are they important in biological control of leaf hoppers, especially in the Pacific Islands, but taxonomically they are in a confused state.

At present the complex includes species belonging to two distinct subfamilies, the Orthotylinae and Phylinae, which, have respectively, flap-like and bristle-like arolia.

Our studies have shown that Fieber was correct when in 1864 he erected the genus *Tytthus* for two species with bristle like arolia. Hence all species with this and other phyline characters (see pp. 13-14) should now be included in *Tytthus;* although later authors, not recognising the importance of the claws, have placed all species included in *Tytthus* under *Cyrtorhinus,* which is in the Orthotylinae. Those species hitherto in *Cyrtorhinus* which have Orthotyline characters mostly remain in this genus, but a few should be transferred to the closely related *Mecomma,* which is retained as a genus. A new genus, *Fieberocapsus,* is raised for *flaveolus* Reuter. This confusion has arisen amongst experienced entomologists because these species, belonging to two different sub-families are so much alike in appearance and have similar habits and habitat; thus being a striking case of convergence.

TAXONOMIC HISTORY OF THE CYRTORHINUS COMPLEX

The genus *Cyrtorhinus* was described by Fieber (Wien. Ent. Monat. 2:313, 1858) to include a single species, *Capsus elegantulus* Meyer-Dür, 1843. Fieber (Eur. Hem.: 69, 1860) separated it, in a key, from other European genera and redescribed the type (Eur. Hem.: 285, 1860).

The genus *Tytthus,* generally regarded by authors as a synonym of *Cyrtorhinus,* was described by Fieber (Wien. Ent. Monat. 8: 82, 1864) to include *Capsus geminus* Flor and *Capsus pygmaeus* Zetterstedt. The type of the genus was later fixed by Kirkaldy ((Trans. Amer. Ent. Soc. 32:128, 1906). The first author to include *Tytthus* in the synonymy of *Cyrtorhinus* was Reuter (Bih. K. Sv. Vet. Akad. För. 3 (1): 31, 1875).

Thomson (Opusc. Ent. 4: 437, 1871) detected the synonymy of *Capsus caricis* Fallen, 1807 and *Capsus elegantulus* Meyer-Dür, 1843.

Reuter (Rev. Crit. Caps. 1: 91, 2: 12, 1875, and Bih. K. Sv. Vet. Akad. Handl. 3 (1): 31, 1875) considered *Cyrtorhinus* as a subgenus of *Chlamydatus* Curtis listing four species with synonymy. Description of the genus and species was given later (Hem. Gymn. Eur. 3: 379, 545, 1883).

Uhler (Proc. Zool. Soc. London: 711, 1893) described *Cylloceps pellicia*, new genus and species from St. Vicent Il., which was later found by China to be a synonym of *Cyrtorhinus parviceps* Reuter (Ann. Mag. Nat. Hist. (9) 14: 444, 1924).

Breddin (Deut. Ent. Zeit.: 106, 1896) described *Periscopus mundulus,* new genus and species from Java, the generic name being preoccupied by *Periscopus* Fitzinger, 1843 (Reptilia). Kirkaldy (Wien. Ent. Zeit. 22: 13, 1903) established *Breddiniessa* a n. nov. for *Periscopus* Breddin.

Distant (Faun. Brit. Ind. Rhync. 2: 476, 1903) redescribed the genus *Cyrtorhinus* Fieber, listing its synonymy and giving a figure of *C. lividipennis* Reuter then found in Ceylon, Burma and Great Nicobar.

Knight (Conn. Nat. Hist. Surv. Bul. 34: 509, 511, 1923) keyed the genus and described *Cyrtorhinus caricis* var. *vagus*, he mentions the typical *caricis* from Colorado and says that he had compared it with a Finnish specimen named by Reuter. A female of this species from Colorado and a series from Wrangel, Alaska are to be found in the U.S. National Museum. Most american records are however *Tytthus vagus* (Knight, 1923), a species of Phylini.

Hueber (Syn. Blindw. 2: 106, 1908) gives a key and descriptions of the German species.

Poppius (Acta Soc. Sci. Fenn. 44 (3): 60, 70, 1914) redescribes the genus from Africa, listing with descriptions, *C. parviceps* and *C. megalogps* (error pro *melanops* Reuter).

Usinger (Proc. Haw. Ent. Soc. 10 (2): 271, 1939) gives host, distribution, notes and a key for the Pacific species, and is the first recent author to draw attention to the fact that some species had only bristle like arolia while others had true convergent arolia. Later (Soc. Sci. Fenn. Comment. Biol. 12 (8): 1, 1951) the same author in a revision of the Pacific species proposed the subgenus *Reuteriessa* for the species with Orthotylini claws and arolia, keeping the *Cyrtorhinus* s. str. for the Phylini species. His work was based on specimens misnamed by E. P. Van Duzee in the California Academy of Sciences, who named a Phylini species (which was

actually the same as Knight's *Cyrtorhinus caricis* var. *vagus)* as the true European *Capsus caricis* Fallen. In the same paper a new species, *C. vitiensis* was described from Fiji.

Blatchley (Hem. Het. E.N. Amer.: 845, 853, 1926) mentions *caricis vagus* Knight and *pygmaeus* from the United States. Here again the author was misled, since *pygmaeus* Flor does not occur in America. Specimens which were named as such by Van Duzee are conspecific with *Cylloceps pellicia* Uhler, actually *Tytthus parviceps* (Reuter).

Zimmerman (Ins. Hawaii, 3 Het.: 205, 1948) gives the history of *Cyrtorhinus* in Hawaii, biological control and notes for *mundulus* and *fulvus* Knight, with good illustrations. Notes on species from Guam are to be found in Usinger (Ins. Guam, II: 79, 1946).

Knight (Ins. Samoa II, Hem. 5, 1935) described *C. fulvus* from Samoa. The same author (Ill. Nat. Hist. Surv. Bul. 22 (1): 82, 95, 1941) mention the presence of *caricis* in Minnesota.

Carvalho (An. Acad. Brasil. Ci. 24 (1): 76, 1952) includes in the synonymy of *Cyrtorhinus* the genus *Aristobulus* Distant (Ann. Mag. Nat. Hist. (8) 5: 16, 1910) and *Nycticapsus* Poppius (Acta Soc. Sci. Fenn. 44 (3): 74, 1914). The authors include them as synonyms of *Mecomma* Fieber in the present paper.

Wagner (Tierw. Deut. 41, Blindw.: 110, 127, 1952) deals with the genus *Cyrtorhinus* in Germany in which he includes *caricis, flaveolus, pygmaeus* and *geminus* with illustrations.

Kiritchenko (Hem. Eur. URSS: 175, 1951) gives keys for the four species mentioned above (in Russian).

Catalogue references on the genus are to be found in Atkinson (1890), Oshanin (1906, 1912), Van Duzee (1917), Stichel (1933), China (1943), Carvalho (1952) and Carvalho & Leston (1952).

MAJOR CHARACTERES SEPARATING ORTHOTYLINAE AND PHYLINAE

The Orthotylinae and Phylinae are most easily separated on three characters:

1. *Pretarsal structure*: the claws of the Orthotylinae have small pads, the pseudarolia, on their undersides, whilst between the claws are a pair of convergent membraneous arolia (Fig. 1 F); pseudoarolia are also present in the Phylinae, but the arolia are thin and hairlike (Fig. 1 G).

2. *Female genitalia*: Slater (1950) found that in typical Orthotylinae the sclerotised rings on the dorsal wall of the bursa copulatrix have their lateral margin strongly folded dorso-mesad:

whilst on the posterior wall, two sclerotised flaps (K structure) arise from the lateral lobes (J structures). The structure of this region in *Orthotylus* has been described in detail by Southwood (1953) and in this subfamily gives good specific characteres. In the Phylinae the sclerotised rings are simple and ovoid or subelliptical in shape and the posterior wall has a pair of bilaterally symmetrical sclerites (A structures), the interspecific variation in these is slight and their taxonomic value is mostly at the generic level.

3. *Male Genitalia*: Singh-Pruthi (1925), Kullenberg (1947) and others have shown the major differences between the typical structure of the aedeagus in Orthotylinae and Phylinae. In the Orthotylinae (Gig. 1 A, B) the genital capsule or pygophore, has an ingrowth, the subgenital plate (Kullenberg 1947). This is secondarily attached to the floor of the genital capsule anteriorly; it is boat-shaped and from its dorsal margin a membrane arises that envelops the lower region of the aedaegal complex. The posterior apices of the subgenital plate are usually dark in colour and have two discrete walls, the outer one continuous with pygophore and the inner and dorsal one running back as the subgenital plate (Fig. 1 B).

The aedeagus itself is attached to the upper margin of subgenital plate by a "tendon", this arises from the apex of the lateral arms of the basal plate, which clearly corresponds to the stapes of Lygaeidae (Bonhag & Wick, 1953). Hence it is possible to homologise the "arm of the phallic pivot" of the latter, with the subgenital plate of Mirids and Nabids (Kullenberg), whilst a similar structure (i.e. an ingrowth from the ninth segment) has been described in the Pentatomoidea and called the inferior process (Sharp, 1890) or the aedeagal support (Leston, 1953).

Attached to the base of each lateral arm of the basal plate or stipes is a "tendon" which runs dorsally and is attached to a plate, the capitate processes or mushroom bodies (Kullenberg) or more corretctly, the promotor apodeme of the phallobase ((Bonhag & Wick). The promotor muscle is attached to this plate and to the dorsal surface of the genital capsule; on the contraction of this muscle the whole aedeagus, pivoted on the stipes—subgenital plate connection, is moved posteriorly and upwards and is in a more suitable position for copulation.

Arising from the basal plate is the tubular basal region of the aedeagus, known as the theca. In the resting condition the rest of the aedeagus is invaginated within the theca. The apical region is the vesica and from its base there arise one or more sclerotised processes, the vesical appendages or spiculae. The gonopore is situated at the apex of the vesica.

Two claspers or parameres are situated on either side of the apices of the subgenital plate. They are asymmetrical and in general in the Orthotylinae differ markedly from one species to another.

In the Phylinae, the most striking superficial feature is the posterolaterally directed sclerotised sheath (Fig. 1 E). According to Kullenberg this consists of a fusion of the subgenital plate and theca. But it seems that owing to the mechanics of the aedaegus during copulation such a fusion is impossible and this sheath cannot be homologised with the theca of the Orthotylinae. It corresponds only with the subgenital plate or aedeagal support and this is confirmed by the attachment of the stapes (Fig. 1 D) to its margin. This structure sharply distinguishes the typical Phyline from the Orthotyline genitalia and is referred to as the aedeagal sheath. The Phylinae differ further in the lack of sclerotised vesical appendages and in the modification of the aedeagus into a strap like structure.

The claspers of related species of Prylinae are often very similar in form, more so than in the Orthotylinae.

INDEX TO SPECIES WHICH MAY BE REFERRED TO THE *CYRTORHINUS-MECOMMA* COMPLEX

CYRTORHINUS	Original generic assignment	Present generic assignment
alboornatus Knight, 1931	Cyrtorhinus	Tytthus
• *annulicollis* Poppius, 1915	Cyrtorhinus	Tytthus
= *chinensis* (Stal, 1859)		
balli Knight, 1931	Cyrtorhinus	Tytthus
caricis Fallen, 1807	Capsus	Cyrtorhinus
collaris Matsumura, 1911	Chlamydatus	?
chinensis Stal, 1859	Capsus	Tytthus
• *chloropterus* Herrich-Scheffer, 1853	Capsus	Cyrtorhinus
= *caricis* (Fallen, 1807)		
cumberi Woodward, 1950	Cyrtorhinus	Cyrtorhinus
• *elegantulus* Meyer, 1843	Capsus	Cyrtorhinus
= *caricis* (Fallen, 1807)		
• *elongatus* Poppius, 1915	Cyrtorhinus	Tytthus
= *chinensis* (Stal, 1859)		
• *filius* Distant, 1910	Aristobolus	Mecomma
= *amicus* (Distant, 1909)		
flaveolus Reuter, 1870	Tytthus	Fieberocapsus
fulvus Knight, 1935	Cyrtorhinus	Cyrtorhinus
geminus Flor, 1860	Capsus	Tytthus

• = a synonym

CYRTORHINUS	Original generic assignment	Present generic assignment
• *insignis* Douglas & Scott, 1866 = *pygmaeus* (Zetterstedt, 1840)	Tytthus	Tytthus
insperatus Knight, 1925	Cyrtorhinus	Tytthus
lividipennis Reuter, 1884	Cyrtorhinus	Cyrtorhinus
marginatus Uhler, 1895	Cyrtorhinus	Orthotylus
melanocephalus Poppius, 1914	Nycticapsus	Mecomma
melanops Reuter, 1905	Cyrtorhinus	Cyrtorhinus
mundulus Breddin, 1896	Periscopus	Tytthus
neotropicalis Carvalho, 1954	*Cyrtorhinus costae* Carvalho nec Stal	Tytthus
parviceps Reuter, 1890	Cyrtorhinus	Tytthus
• *pellicia* Uhler, 1893 = *parviceps* (Reuter, 1890)	Cylloceps	Tytthus
• *pellucens* Boheman, 1852 = *pygmaeus* (Zetterstedt, 1840)	Capsus	Tytthus
•*pubescens* Knight, 1931 = *geminus* (Flor, 1860)	Cyrtorhinus	Tytthus
pygmaus Zetterstedt, 1840	Capsus	Tytthus
• *riveti* Cheesman, 1927 = *chinensis* (Stal, 1859)	Cyrtorhinus	Tytthus
vagus Knight, 1923	Cyrtorhinus	Tytthus
•*vitiensis* Usinger, 1951 = *lividipennis* Reuter, 1884	Cyrtorhinus	Cyrtorhinus
swaluwenburgi Usinger, 1944	Cyrtorhinus	Tytthus
MECOMMA		
ambulans Fallen, 1807	Capsus	Mecomma
amicus Distant, 1909	Antiphilus	Mecomma
antennata Van Duzee, 1917	Mecomma	Mecomma
• *dubius* Zetterstedt, 1840 = *ambulans* (Fallen, 1807)	Capsus	Mecomma
chinensis Reuter, 1906	Mecomma	Mecomma
gilvipes Stal, 1858	Leptomerocoris	Mecomma
• *luctuosus* Provancher, 1887 = *gilvipes* (Stal, 1858)	Chlamydatus	Mecomma
madagascariensis Reuter, 1892	Mecomma	Mecomma
• *nigritulus* Zetterstedt, 1840 = *ambulans* (Fallen, 1807)	Capsus	Mecomma
• *ochripes* Curtis, 1838 = *ambulans* (Fallen, 1807)	Chlamydatus	Mecomma

• = a synonym

KEY TO GENERA

1. Pretarsus with a pair of bristle-like arolia (Fig. 1 G), male pygophore with a strongly sclerotised tubular sheat for the aedaegus (Fig. 1 D) (Phylinae) .... *Tytthus* Fieber
   Pretarsus with a pair of flap-like arolia (Fig. 1 F), male pygophore not developed to form such a projecting sheath (Orthotylinae) 2
2. Pronotum straight sided (Fig. 10 G), its lower margin slightly concave, cuneus wider than long (Fig. 16 C), (pubescence short: 0.08-0.12 mm. without any black coloration) .... *Fieberocapsus* n. gen.
   Pronotum bell-shaped or campanuliform (Fig. 15 A), its lower margin straight (frequently partly or entirely black) 3
3. Cuneus only slightly longer than wide (Fig. 16 A); slightly rounded in outline; pubescence short; 0.15 mm. or less, rostrum not reaching posterior coxa (never completely brachypterous) .... *Cyrtorhinus* Fieber
   Cuneus considerably longer than wide (often twice as much) (Fig. 16 B); males almost parallel sided; pubescence long: mostly over 0.15 mm.; rostrum reaching beyond base of posterior coxa (females often completely brachypterous (Fig. 22 A, B) .... *Mecomma* Fieder

GENUS *TYTTHUS FIEBER*

Tytthus Fieber, Wien. Ent. Monat. 8:82, 1864.

* *Cylloceps* Uhler, Proc. Zool. Soc. London : 711, 1893 (nov. syn.).

* *Periscopus* Breddin, Deut. Ent. Zeit. . 106, 1896 (noem. preoc. by *Periscopus* Fitzinger, 1843, Reptilia).

* *Breddiniessa* Kirkaldy, Wien. Ent. Zeit. 22:13, 1903 (nom. nov. for Periscopus Breddin, 1896) (n. syn.).

Type species: *Capsus geminus* Flor, 1860, fixed by Kirkaldy, Trans. Amer. Ent. Soc. 32:128, 1906.

Small bugs (2.2-3.6 mm.): head rounded anteriorlq, face semi vertical; pronotum campanuliform, calli slightly marked; opening of odiferous gland raised and well marked, pretarsus with bristle like arolia; male pygophore with a projecting aedeagal sheat; female bursa copulatrix with symmetrical A structures. Covered by simple erect pubescence (0.10-0.19 mm. in length); rostrum reaching the hind coxae; colour pattern generally black and pale green.

KEY TO THE SPECIES OF THE GENUS *TYTTHUS*

1. Colour pale yellowish testaceous ....
.... *zwaluwenburgi* (Usinger)
Colour if pale then pronotum, head and scutellum black or with dark brown to black areas 2
2. Firts antennal segment pale, darkened only at extreme apex or extreme base 3
First antennal segment black, pale only at extreme base and apex 6
3. Hemelytra white at least on basal third 4
Hemelytra darkened basally or unicolorous but not as above
.... 5
4. Hemelytra with a wide dark brown to black fascia, the basal third and cuneus whitish .... *alboornatus* (Knight)
Hemelytra with only basal third whitish ... *montanus* n. sp.
5. Hemelytra noticeably infuscate longitudinally along clavus and endocorium, pronotum totally black ....
.... *mundulus* (Breddin)
Hemelytra pale green, if infuscate, the pronotum pale at basal angles .... *geminus* (Flor)
6. First antennal segment entirelly black, tibiae black to dark brown; pronotum slightly constricted at middle 7
First antennal segment pale at least on extreme apex or base, tibiae pale to fuscous, not black; pronotum not constricted at middle 8
7. Pronotum brownish black with a transverse milky white fascia in front of calli, cuneus pale .... *insperatus* (Knight)
Pronotum orange yellow on anterior margin of disc, cuneus with a darkened apex .... *balli* (Knight)
8. First antennal segment with a black ring at middle leaving apical and basal third white ...... *neotropicalis* (Carvalho)
First antennal segment mostly black, with only extreme apex or base pale 9
9. Pronotum usually pale anteriorly (in front, between or over calli) 10
Pronotum usually totally black or dark brown 11
10. Tibiae entirely yellow; pronotum varying from pale with only posterior angles black to black with a pale central area anteriorly .... *pygmaeus* (Zetterstedt)
Tibiae with extreme base dark; pronotum black, only pale anteriorly .... *parviceps* (Reuter)

11. Tibiae entirely pale, hemelytra largely infuscate, paler along anterior margin (large species, about 2.8 mm long) .... *vagus* (Knight)
    Tibiae with extreme base or basal portion brownish to black; hemelytra mostly pale green 12
12. Pale spots on vertex obsolete; underside rufescent .... *panamensis* n. sp.
    Pale spots on vertex distinct; underside dark brown to black 13
13. Larger species, the spots on vertex larger .... *parviceps* var. *thoracicus* (Horvath)
    Smaller species, the spots on vertex minute .. *chinensis* (Stal)

TYTTHUS ZWALUWENBURGI (USINGER) nov. comb.

Cyrtorhinus zwaluwenburgi Usinger, Proc. Hawaii. Ent. Soc. 12 (1): 148, fig. 1, 1944.

(Fig. in Usinger, 1944)

Characterized by its entirely pale yellowish testaceous colour and dimensions.

Male: length 2.3 mm., width 0.8 mm.

Colour pale yellowish testaceous except for dark brown eyes and a vague brown area at middle of head.

Rostrum reaching nearly to apices of middle coxae.

Distribution: Canton Is.

Specimens studied: 1 ♂, Type, Canton Is., Hawaii Sugar Planter's Exp. Station.

This species according to Usinger (1944) is very close to *riveti* Cheesman (= *chinensis* Stal) in size and structure but is strikingly different from *riveti* and all other described species in colour pattern. It will run to *riveti* in Usinger's key (Hawaii. Ent. Soc. Proc. 10: 271, 1939), but *riveti* has shorter second antennal segment (less than three times as long as first, 12: 5), a longer rostrum which surpasses apex of middle coxa and different colour.

It was taken on Boerhaavia associated with the cicadellid, *Nesaloha cantonis* Oman, and is possibly a predator of this species.

TYTTHUS CHINENSIS (STAL) nov. comb.

Capsus chinensis Stal., Freg. Eug. Resa, Hem.: 258, 1859.
Cyrtorhinus chinensis Reuter, Öfv. F. Vet. Soc. Forh. 45 (16): 22, 1903.

* *Cyrtorhinus elongatus* Poppius, Arch. Naturges. 80 A (8): 65, 1914 (*n. syn.*)

* *Cyrtorhinus annulicollis* Poppius, Arch. Naturges. 80 A (8): 66, 1914 (*n. syn.*)

* *Cyrtorhinus riveti* Cheesman, Ann. Mag. Nat. Hist. 19: 94, 1927 (*n. syn.*); Usinger; Soc. Sci. Fenn. Comment. Biol. 12 (8): 4, 1951.

(Figs. 2 A-E)

Characterized by its colour and male genitalia.

Male: length 2.1-2.5 mm., width 0.8 mm.; head, width 0.6 mm., vertex 0.31 mm.; antennae, segment I length 0.23 mm.; II 0.7 mm.; III 0.45 mm.; IV 0.28 mm.; pronotum, length 0.3 mm., width 0.75 mm.; rostrum legth 0.70 mm.

Head black apart from two areas adjacent to the eyes, which are pale; antennae brown-black with extreme apex of first segment pale; pronotum and scutellum black; hemelytra pale green, membrane and nervures pale; legs yellow green to pale fulvous except for extreme base of tibia which is black; rostrum pale, tip dark; underside of thorax dark, abdomen dark except for extreme venter of segments 2-8 which is green-yellow.

Pubescence of fine pale adpressed hairs, some of those on the back of the head and anterior of the pronotum are slightly longer and more erect. Macropterous.

Genitalia: aedeagus (fig. 2 B) of phyline type; left clasper (fig. 2 C) with basal process slightly shorter than in *parviceps;* right clasper (fig. 2 D) simple.

Female: similar to male in colour and dimensions, slightly more robust.

Distribution: China, Formosa, Bonin Ils. (Chichi Jima), Marianas Ils. (Guam, Saipan, Rota, Tinian), Caroline Ils. (Palau Ils., Ngulu, Faraulep, Yap, Koror, Pulo Anna), New Hebrides, Samoa, Tahiti, Fiji.

Specimens studied: 1 ♂ (Holotype of *elongatus*), Anping, Formosa, Sauter 1911 (Deutsches Entomologisches Institut); 1 ♂ (Holotype of *annulicollis*), Tainan, Formosa, H. Sauter (Deutsches Entomologisches Institut); 1 ♀ (Type of riveti), Papeete, Tahiti, March-April 1925, L. E. Cheesman (British Museum); 1 ♂, 2 ♀, Amalui, Tutuila, Samoa, 9.6.23, Swezey and Wilder; 1 ♂, 1 ♀, Chekiang Prov., China, July 1927, Dora Wright; 2 ♂, Upolu, Samoa, 9.12-23 (Bermuda grass), Swezey and Wilder; 1 ♂, 1 ♀, Erromanga, New Hebrides, July 1930, L. E. Cheesman; 26 ♂, 29 ♀, MARIA-

NAS ISL., Guam: Pt. Oca, 5.12.45, J. L. Gressit (collected at light); Talofofo, Aug. 1949, N. L. H. Krauss; Agana airport, 15.8.45, H. S. Dybas; *Saipan*: 1-2 m. of Tanapag, 10.1.45, H. S. Dybas; *Tinian*: July 1946, H. K. Townes; *Rota*: June 1936, T. Esaki; *CAROLINE ILS.*, *Pulo Ana*: 13.9.52, N. L. H. Krauss; *Koror Is*: 30.11.47, H. S. Dybas; *Ngulu Atoll*: Ngulu Ils, 3.10.52, N. L. H. Krauss; *Faraulep Atoll*: Faralep Is. 21.9.52, N. L. H. Krauss; *Yap group*: E. Mafrid, Kanif Yaf, Colonia Yafrid, July 1950, R. J. Goss; BONIN ILS.: *Chichi Jima Retto*: Aug. 1934, H. Ikeda.

Usinger (1939) found this species sucking eggs of *Sogata ochrias* Kirkaldy on *Sporolobus virginicus* and of *Nilaparvata lugens* (Stal) on rice.

This is the smallest species of *Tytthus* and is distinguished by its black pronotum and scutellum, the dark bases of the tibia and the small size.

D. R. Malaise of the Riksmuseum, Stockholm, has kindly informed us that the type of *Capsus chinensis* must be considered lost. We consider that this species is referred to in Stal's description (*Freg. Eug. Resa*: 258, 1859): —

"Nigricans, maculis duabus basalibus capitis albidis; hemelytris fuscescente albidis; pedibus abdominisque disco pallide testaceo-flavis.

Female. Long. 3, lat. 1 1/3 millim. Patria: China (Hongkong).

C. elegantulo affinis et similis, capite angustiore, thorace posterius latiore, antennis, praesertim articulo basali, brevioribus differt."

The Director of the Deutsches Entomologisches Institut has kindly sent Poppius' types for study. That of *elongatus* represents a teneral male specimen of *T. chinensis;* the measurements agree except for the third and fourth antennal segments which are somewhat shrivelled, whilst the head (apart from the spots on the vertex), the pronoum and scutellum are light brown instead of black. The type of *annulicollis* is a typical male of *T. chinensis*.

TYTTHUS PARVICEPS (REUTER) nov. comb.

Cyrtorhinus parviceps Reuter, Rev. d'Ent. 9: 258, 1890; Poppius, Acta Soc. Sci. Fenn. 44 (3): 70, 1914.

* *Cylloceps pellicia* Uhler, Proc. Zool. Soc. London: 712, 1893 (syn. by China, Ann. Mag. Nat. Hist. (9) 14: 444, 1924).

(Figs. 3 I-M)

Characterized by its colour and genitalia.

Male: length 2.4-2.7 mm.; width 0.85-0.95 mm.; head width 0.58 mm.; vertex 0.3 mm.; antennae, segement I length 0.3 mm.,

II 0.84 mm., III 0.5 mm., IV 0.4 mm.; pronotum, length 0.29 mm., width 0.75 mm.; rostrum length 0.75mm.

Head black with two pale areas adjacent to the eyes; antennae black except apex of basal joint which is pale; pronotum black with two paler (usually yellowgreen) areas at anterior angles; scutellum black; hemelytra pale yellow-green, membrane and nervures pale; legs pale yellow-green with extreme base of tibia dark; rostrum pale, its tip dark; underside of thorax and pygophone black, remainder of abdomen green.

Pubescence of fine pale adpressed hairs, longer than in *pygmaeus*, especially on the back of the head. Macropterous.

Genitalia: aedeagus of phyline type (fig. 3 C), left clasper (fig. 3 I, J, K) with terminal process blunt and slightly curved inwards at apex, right clasper (fig. 3 M) simple.

Female: length 2.5-3.0 mm.; width 0.95-1.1 mm.; head width 0.63 mm., vertex 0.35 mm.; antennae, segment I length 0.28 mm., II 0.78 mm., III 0.5 mm., IV 0.4 mm.; pronotum, length 0.36 mm., width 0.92 mm.; rostrum length 0.75 mm.

Similar to male in colour. Abdomen with underside pale green-yellow, lateral margins dark, dorsum pale. Dorsal wall of bursa copulatrix very simple, as in *balli* and *vagus*.

Distribution: Egypt, St. Vicent, Seychelles, Rodriguez I., Paraguay, Florida, East and West Africa, Morocco, Gigepio Is. Italy, S. Africa (Cape Province), St Helena.

Specimens studied: ♀ (Type) Cairo, May 1886, E. Antian (B.M.); 1 ♀ (Type of C. pellicia), St. Vicent, May, H. H. Smith (B. M.); 1 ♂ 3 ♀ Rodrigues II., Aug.-Sept. 1918, H. J. Snell & H. P. Thomasset; 3 ♂ 1 ♀ Lakeland, Florida (at light), Oct. 1918, May 1952, R. F. Hussey; 1 ♀ Mossel Bay, Cape Province, May 1932, R. E. Turner; 1 ♂ beaten from native Composite Tree, Picquet Post, St. Helena 27/2/36, H. F. D. Bartlett; 1 ♀ Waldia, Abyssinia, 1-26/2/36, J. W. C. MacFie; 1 ♀ Libreville, Gabon, J. Primot; 1 ♀ Serpent Lake, c. 9,000 ft., Wouramboulchi, Abyssinia 5/10/26, J. Omer Cooper; 1 ♀ Hora Keloli, Abyssinia, Dec. 1926, J. Omer Cooper; Cuba, Uhler col.; Pto. Obaldia, Cocle Prov., Panamá, Blanton col.; Managua, Nicaragua, Baker col.

This species is close to *T. pygmaeus* (Zetterstedt) but differs in the narrower head, in the black ring at extreme bases of tibiae and in the structure of the male genitalia; the pronotum is generally darker. The form *thoracicus* was described from the Canary Ils. by Horvath (Ann Mus. Nat. Hung. 8: 289, 1909) and is characterised by having the pronotum entirely black. This form has subsequently

been refound in the same area by Lindberg (1936, 1953), but it does not appear to have been found elsewhere. However the amount of black colouration on the pronotum is very variable within one population of *T. pygmaeus* and this probably applies to other species.

Since the comments above were writen the senior author has seen specimens of this species in the U.S. National Museum in which the variation mentioned above is to be seen. The following localities should be added: Charlotte Amalie, St. Thomas, Virgin Is. VI, 917, H. Morrison col.; Macoris River, San Domingo, VII, 917, H. Morrison col.; Cuba (labelled by Uhler as *Cylloceps pellicia*); Guanajibo, Puerto Rico, VIII, 935, H. L. Dozier col.; Lake Placid, Florida, Beamer col.; Fellsmore, Florida (named by Barber as *pellicia*), in action of ovipositing in egg of *Saccharosydre sacharyvora* (Westwood); Guapara, Carabobo, Venezuela, IX, 938, C. H. Ballou (on cotton).

TYTTHUS PYGMAEUS (ZETTERSTEDT)

Capsus pygmaeus Zetterstedt, Ins. Lapp.: 279. 1840.

Tytthus pygmaeus Fieber, Wien Ent. Monat. 8: 82, 1864.

* *Capsus pellucens* Boheman, Ofv. Sv. Vet. Akad. Forh.: 76, 1852 (syn. by Reuter, Not. Sallsk. F. Fl. Fenn. Forh. 14: 16, 1873).

Cyrtorhinus pygmaeus Reuter, Hem. Gymn. Eur. 3: 381, 554, pl. 2, fig. 4, 1883; Saunders, Hem. Het. Brit. Is.: 283, pl. 26, fig. 6, 1892; Wagner, Tierw. Deut. 41, Blindw.: 128, 1952.

* *Tytthus insignis* Douglas & Scott, Ent. mon. Mag. 2: 247, 1866 (syn. by Saunders, Ent. mon. Mag. 13:113, 1876).

(Figs. 3A-G)

Characterised by its colouration and genitalia.

Male: length 2.85 mm.; width 1.0 mm.; head, width 0.7 mm., vertex 0.32., antennae, segment I length 0.32 mm., II 1.03 mm., III 0.76 mm., IV 0.76 mm.; pronotum, length 0.34 mm., width 0. 80 mm.; rostrum length 1.15 mm.

Head black with two pale areas adjacent to the eyes; antennae dark except for apex of basal and base of second segments pale; pronotum varying from pale with only the extreme posterior angles dark to black with a pale central area anteriorly; scutellum black; hemelytra pale grey-green, nervures and membrane pale grey; legs yellow; rostrum pale, its tip dark; underside of thorax and pygophore black, rest of abdomen pale green suffused with fuscous towards pygophore.

Pubescence of fine pale adpressed hairs. Macropterous.

Genitalia: aedeagus (fig. 3 C) of phyline type, left clasper (fig. 3 E, H) with comparatively short process, right clasper (fig. 3 F) simple.

Female: length 3.2 mm., width 1.22 mm.; head, width 0.78 mm., vertex 0.38 mm.: antennae, I 0.32 mm., II 0.87 mm. III 0.76 mm.; IV 0.77 mm.; pronotum length 0.37 mm., width 0.87 mm., rostrum length 1.2 mm.

Colour and pubescence as in male. Macropterous.

Distribution: England, Wales, Netherlands, N. France, Sweden,Lappland, Finland, N. Russia, N. Germany.

Specimens studied: 6 ♂ 6 ♀ Houndslow Heath, Middlesex, U. K., 20/7/53, G. E. Woodroffe; 1 ♀ Harpenden, Herts, U. K. 11/8/54, T. R. E. Southwood; 1 ♀ Flatford, Suffolk, U. K., 26/8/54, T. R. E. Southwood; 1 ♀ Pergas, Finland, Dr. Eger; 1 ♀ which has been designated the lectotype, labelled "Esher" and "Tytthus Fieb, insignis Scott J. nova spec." from the Scott collection, now in Power collection (B. M.).

The degree of pigmentation of the pronotum of this species varies greatly, even within one population; but in general it is largely pale at the anterior and this together with the entirely yellow legs and the mostly dark basal antennal segment distinguishes it. Wagner (1952) records this species from marshy places around the bases of rushes and grasses: it is however occasionally taken by sweeping and occurs as an adult in July and August (earlier than *geminus* whose range is similar). The winter is passed in the egg stage.

TYTTHUS VAGUS (KNIGHT) nov. comb.

Cyrtorhinus caricis vagus Knight, Conn. Nat. Hist. Surv. Bul. 34: 511, 1923.

(Fig. 4 A-E)

Characterised by its colour and male genitalia.

Male: length 2.8 mm., width 1.2 mm.; head, length 0.2 mm., width 0.6 mm., vertex 0.32 mm., antennae, segment I, length 0.2 mm., II 0.8 mm., III ... mm., IV ... mm., pronotum, length 0.3 mm., width at base 0.8 mm., rostrum, length 0.7 mm.

Head black, shining, pale spots on vertex scarcely apparent. Antennae with first segment black, apex pale, remaining segments black; pronotum and scutellum black; hemelytra uniformly fuscous,

the latter slightly paler along embolium; cuneus and membrane pale fuscous; legs pale, coxae, hind femora except base and more narrowly at apex, fuscous.

Morphological characters as given for genus.

Genitalia: aedeagus of the Phyline type. Left clasper (fig. 4 E) with both branches strongly pointed. Right clasper (fig. 4 D) short and compact.

Female: similar to male in colour and dimensions. Sclerotized ring and dorsal wall of bursa copulatrix as in figures 4 B, C.

Distribution: New York, Massachussets, New Jersey, Virginia, N. Carolina, Colorado, U.S.A.

Specimens studied: 1 ♂ and 1 ♀ paratypes, New Jersey, Lakehurst (Knight's collection); 12 specimens, Piney Point, Md., VIII 946. A. I. Sailer col.; 1 spp. Boston, Mass. (named by Knight as *C. caricis vagus* Knight.).

This species shows some convergence with *Cyrtorhinus caricis* (Orthotylini) but is a typical Phylini in the structure of claws and genitalia. It is closest to *parviceps, neotropicalis, pygmaeus* and *chinensis,* but distinguished in the colour of antennae and pronotum, as well as in the structure of claspers. So far most American specimens seen by the senior author and named as *caricis* auct. are to be referred to this species.

TYTTHUS NEOTROPICALIS (CARVALHO) nov. comb.

Cyrtorhinus costae Carvalho nec Stal, Rev. Brasil. Biol. 5 (1): 316, figs. 1, 2, 3, 1945.

Cyrtorhinus neotropicalis Carvalho, An. Acad. Brasil. Ci. 26 (3-4): 425, 1954.

(Figs. in Carvalho, 1945)

Characterised by its colour, dimensions and male genitalia.

Male: length 2.9 mm., width 0.8. mm.; head, length 0.2 mm., width 0.5 mm., vertex 0.28 mm., antennae, segment I, length 0.2 mm., II 0.8 mm., III 0.6 mm.; IV 0.3 mm., pronotum, length 0.4 mm., width at base 0.7 mm., rostrum, length 1.4 mm.

Colour fuscous to black on head, pronotum and scutellum, the hemelytra and legs pale; antennae black (except apex and base of first segment); hemelytra infuscate on the clavus; pale spots of vertex obsolete. Rostrum reaching the middle coxae.

Genitalia: left clasper bifurcate with several dorsal setae. Right clasper falciform.

Female: similar to male in colour and dimensions.

Distribution: Km. 47 Estrada Rio S. Paulo, Rio de Janeiro, Viçosa, Minas Gerais, Goias, Brazil.

Specimens studied: 3 ♂ 5 ♀ D. Federal, Rio de Janeiro, Brazil.

This species was described and figured by the senior author in 1945 as *Cyrtorhinus* costae (Stal, 1860). After studyng types in Stockholm it was found that *costae* (Stal) is a species of *Falconia* Distant and not a *Cyrtorhinus* as stated by Berguoth (1922). The name *neotropicalis* was preposed for the species An. Acad. Brasil. Ci. 26 (3-4): 425, 1954. It can be distinguished from other species by the blac ring of the first antennal segment, being closet to *vagus* Knight which has the first antennal segment largerly black and pale spots on vertex well marked.

TYTTHUS MUNDULUS (BREDDIN) nov. comb.

Periscopus mundulus Breddin, Deut Ent. Zeit.. 106, 1896.

Cyrtorhinus mundulus Reuter, Ofv. F. Vet. Soc. Forh. 44: 178, 1902, Zimmerman, Ins. Hawaii, 3, Het.: 206, fig. 88, 1948; Usinger, Soc. Sci. Fenn. Comment. Biol. 12 (8): 4, fig. 1951.

(Fig. in Zimmerman, 1948)

Characterised by its size, colour and genitalia.

Male: length 3.5. mm., width 1. 0 mm.; head, width 0.7 mm., vertex 0.36 mm.; antennae, segment I, length 0.35 mm., II 1.10 mm., III 0.62 mm., IV 0.5 mm.; pronotum, length 0.38 mm., width 0.85 mm., rostrum length 1.1 mm.

Head black-brown except for two pale areas adjacent to the eyes, occasionally entirely dark; basal segment of antennae pale fulvous with the apex sometimes darker, other segments usually fuscous; pronotum and scutellum black-brown; hemelytra pale green suffused with brown towards the suture, cell nervures brown; legs yellow-green to pale fulvous; rostrum pale green tip dark; underside brown-black.

Pubescence of pale fine hairs especially long at the posterior of head and anterior of thorax; macropterous.

Genitalia: aedeagus of phyline type (fig. 5 E), left clasper (fig. 5 C) with terminal process stouter than in *germinus*, right clasper (fig. 5 G) simple.

Female: length 3.25 mm.; width 1.2 mm.; head, width 0.75 mm., vertex 0. 38 mm.; antennae, I 0.35 mm., II 1.0 mm., III 0.50 mm., IV 0.35 mm.; pronotum, length 0.45 mm., width 0.90 mm.; rostrum length 1.0 mm.

Colour and pubescence as in male; macropterous.

Distribution: Java, Fiji, Philippine Ils. Queensland (Australia), (Introduced intto Hawaii).

Specimens studied: 5 ♂ 4 ♀ Natoua, Fiji, April 1919, R. Veitch; 2 ♀ Lahaina Maui, Hawaii, Swezey col. Dec. 1928; 2 ♀ Halifax, Queensland, Australia, April 1920, F. Muir; 1 ♂ 1 ♀ Los Banos, Philippine Ils., Williams col.

The largest species of *Tytthus*, distinguished by its pale basal antennal segment and general dark colouration.

According to Zimmerman (1948) "this species was introduced in Hawaii in 1920, from Queensland and Fiji, to aid in the control of the sugarcane leafhopper, *Perkinsiella sacharicida* Kirkaldy. It became established and constitutes one of the outstanding records in the history of biological control. It has saved the Hawaiian sugar industry the Territory millions of dollars—its true worth can hardly be estimated".

The predatory habits of the species were discovered by Dr. Muir in Queensland (1920) (Swezey, 1936).

It may also feed on the eggs of *Peregrinus maidis* (Ashmead) on corn and *Megamelas proserpina* Kirkaldy, on taro.

TYTTHUS ALBOORNATUS (KNIGHT) nov. comb.

Cyrtorhinus alboornatus Knight, Bul. Brook. Ent. Soc. 26 (4): 172, 1931.

(Figs. 6 A-G, 7 A)

Characterized by the dark colour with basal two fifths of hemelytra pale whitish, cuneus likewise pale and male genitalia.

Male, macropterous: length 2.3 mm., width 0.8 mm., head, lenght 0.1 mm., width 0.5 mm., vertex 0.30 mm., antennae, segment I, lenght 0.3 mm., II 1.0 mm., III 0.7 mm., IV 0.7 mm., pronotum, length 0.3 mm., width at base 0.7 mm., rostrum, length 0.9 mm.

Colour dark brown to black, basal two fifths of hemelytra and entire cuneus pale whitish; distal half of coxae and bases of femora pale to whitish; tibiae and tarsi pale fuscous, spines black; membrane and veins rather uniformly pale fuscous.

brachypterous: lenght 1.7 mm., width 0.7 mm., head, length 0.2 mm., width 0.6 mm., vertex 0.30 mm., antennae, segment I, length 0.2 mm., II 0.7 mm., III 0.2 mm., IV 0.2 mm., pronotum, length 0.3 mm., width at base 0.6 mm., rostrum, length 0.7 mm.

Colour black; basal two thirds and apical one sixth of hemielytra, white; first antennal segment (except extreme base), coxae, extreme bases and apices of femora, the tibiae towards the apex and rostrum, sordid yellow.

Hemelytra without indication of cuneus or membrane; rostrum reaching the posterior coxae; posterior femora much longer and stouter than others; pubescence short and semiadpressed.

Genitalia: no macropterous forms were available for dissection. In the brachypterous form the aedeagus is of the Phyline type (fig. 6 F). Left clasper (fig. 6 G, H) as seen in illustration, with the arm somewhat laminate and much less sclerotized, the left arm ending by a spinelike point. Right clasper very small. Pygophore (fig. 6 B, D) as shown in illustrations; the sheath is noticeably pointed (fig. 6 E).

Female: similar to male in colour, slightly more robust.

Distribution: Florida, New York, U.S.A.

Specimens studied: 1 ♂ holotype, Jacksonville, Florida (Knight's collection); 2 ♂ brachypterous, Titusville, Florida, 4.2.52, H. C. Chapman.

This species can be easily recognized by the whitish base of hemelytra and cuneus, which seem to be contant also in the brachypterous form.

TYTTHUS GEMINUS (FLOR)

Capsus geminus Flor, Rhync. Livl. 1: 606, 1860.

Tytthus geminus Fieber, Wien. Ent. Monat. 8 (3): 83, 1864.

Cyrtorhinus geminus Reuter, Hem. Gymn. Eur. 3: 382, 554, pl. 2, fig. 5, 1883; Wagner, Tierw. Deut. 41, Blindw.: 129, 1952.

Chlamydatus (*Cyrtorhinus*) *geminus Reuter,* Rev. Crit. Caps. 2: 126, 1875.

* *Cyrtorhinus pubescens* Knight, Bul. Brook. Ent. Soc. 26 (4): 172, 1931 (n. syn..).

(Figs. 8 A-G)

Characterised by its colour, the long black hairs and male genitalia.

Male: length 2.6 mm., width 1.0 mm.; head, width 0.65 mm., vertex 0.33 mm.; antennae, segment I, length 0.38 mm., II 1.0 mm., III 0.79 mm., IV 0.65 mm.; pronotum, length 0.33 mm., width 0.76 mm.; rostrum length 1.15 mm.

Head black with two pale areas adjacent to the eyes; antennae dark except for basal joint which is only dark at extreme base; pronotum anteriorly dark fading to pale brown at posterior, scutellum black or brown, darker in the median area; hemelytra pale green-brown, membrane pale; legs entirely pale yellow-green, rostrum yellow-green, dark at apex; pleurites and sternites of thorax, dorsum and lateral margin of abdomen and pygophore dark brown, extreme ventral area of abdomen pale green-yellow.

Pubescence, long (0.19 mm.) dark erect hairs on posterior of head and anterior of pronotum (fig. 8 B), short dark and mostly adpressed hairs on the legs, otherwise pubescence of short adpressed mixed pale and dark fine hairs; macropterous.

Genitalia: aedeagus (fig. 8 E) simple.

Female: length 2.5-3.25 mm., width 1.05-1.25 mm.; head, width 0.75 mm., vertex 0.35 mm.; antennae, I 0.40 mm., II 0.90 mm., III 0.75 mm., IV 0.7 mm.; pronotum, length 0.42 mm., width 0.85 mm.; rostrum length 1.18 mm.

Colour as in the male, but pronotum sometimes entirely dark an with the dorsum and lateral areas of the abdomen dark, the entire venter pale yellow-green.

Pubescence as in the male. Semi-brachypterous, hemelytra reaching to the base of the 7th abdominal segment, membrane reduced.

Distribution: England, N .Russia, Finland, Siberia, Livonia, N. Germany, Denmark, Sweden.

Specimens studied: 1 ♀ Wicken Fen, Cambs., 19/9/34, H. St. J. Donisthorpe; 1 ♂ 2 ♀ Madeley, Staffs., 22/9/31 H., W. Daltry; 2 ♀ Finland, R. Linnavuori; 1 ♂ Porgos, Finland, J. Sahlberg.; 1 ♂ 3 ♀ Anchorage, Alaska, VIII, 918, R. I. Sailer col., 1 ♀ Colorado, Uhler col., holotype (*pubescens*), Wray, Colorado, Knight's collection.

This species is easily distinguished by the long black hairs, the entirely yellow legs, the pronotum usually paler posteriorly and the basal segment of the antennae almost entirely pale. Semi-brachypterous males and macropterous females are known (Wagner 1952),

but none were available for study. It is associated with various species of *Carex* and is found as an adult in September and October (Butler, 1923).

The amount of dark colour on head and pronotum varies within the species.

TYTTHUS BALLI (KNIGHT) nov. comb.

Cyrtorhinus balli Knight, Bul. Brook. Ent. Soc. 26 (4): 171, 1931.

(Fig. 5 A, D F)

Characterized by its colour, short antennal segments and bi-coloured aspect of the hemelytra.

Male: length 2.7 mm., width 0.7 mm., head, length 0.1 mm., width 0.6 mm., vertex 0.32 mm.; antennae, segment I, length 0.2 mm., II 0.6 mm., III 0.7 mm., IV 0.5 mm.; pronotum, length 0.2 mm., width at base 0.6 mm.; rostrum, length 1.0 mm.

Head black, shining, a pale spot each side of vertex bordering eye; antennae black, a trace of pale at tip of second segment; pronotum pale fuscous to blackish, anterior margin of disk orange yellow; mesoscutum and scutellum dark fuscous, with orange tint in hypodermis; hemelytra pale and fuscous, inner half of clavus bordering scutellum, apical half of corium, apical half of embolium except tip, and apical half of cuneus fuscous to blakish; membrane rather uniformily pale fuscous, a shade darker on areoles and veins. Underside of body brownish to black, abdomen pale beneath, genital segment black; legs pale to orange coloured, tibiae and tarsi blackish.

Genitalia: aedeagus of the Phyline type. Left clasper (fig. 5 D) with apices of branches short and pointed. Right clasper (fig. 5 F) elongate with a pointed outgrowth near apex.

Female: similar to male in colour and dimensions.

Distribution: Florida, Texas, U.S.A.

Specimens studied: 1 ♂ 1 ♀ paratypes, Jacksonville, Florida (Knight's collection); 1 ♂, México (an roses), intercepted Brownsville, Texas.

This species is well distinguished amongst the others in the genus by the anteriorly narrowed pronotum and colour pattern of the body. It is nearest to *C. insperatus* Knight, especially in antennal length and shape of pronotum, but differs in colour and size.

TYTTHUS INSPERATUS (KNIGHT) nov. cob.

Cyrtohhinus insperatus Knight, Bul. Brook. Ent. Soc. 30: 43, 1925.

(Fig. 9)

Characterized by its colour and male genitalia.

Male: length 3.0 mm., width 0.8 mm.; head, length 0.2 mm., width 0.6 mm., vertex 0.28 mm.; antennae, segment I, length 0.3 mm., II 1.5 mm., III 1.0 mm., IV 0.5 mm.; pronotum length 0.3 mm., width at base 0.7 mm.; rostrum, length 1.0 mm.

Head black with a small pale ocellate spot each side of vertex above eye; rostrum reddish yellow, basal segment greenish, apical segment black; antennae black, finely pale to dusky pubescent; pronotum brownish black, becoming fulvous basally, anterior margin pale, scutellum and mesoscutum fulvous, the mesoscutum broadly exposed and tinged with fuscous; hemelytra semitranslucent, fumate, basal area of corium and narrow margin of clavus pale translucent, clavus fuscous, except along claval suture, the scutellar margin and slenderly along commissure fulvous; membrane and veins uniformly fumate, anal area darker; sternum fulvous, sides, pleura and ostiolar peritreme becoming fuscous; legs pale fulvous, tibiae and tarsi black, femora with fuscous line along dorsal margins, also a reddish to fuscous longitudinal line on anterior face, this line being more subventral on front femora; abdomen greenish with a metallic luster, genital segment black.

Genitalia: no male specimens were available for dissection.

Female: more robust than male but similar in colouration.

Distribution: Arizona, U.S.A.

Specimens studied: 1 ♂ and 1 ♀ paratypes, Tucson, Arizona, A. A. Nichol (Knight's collection); 1 ♂. 1 ♀, Calexico, Calif. Ball col., 1 ♂, Buckeye, Arizona, Johnson col.

This species is easily recognized by its very long second antennal antennal segment and the white transverse area on anterior portion of pronotum. It shows also a protruding clypeus and a short neck, characters which set it apart from the remaining species and probably from the genus. Once specimens are available for dissection, it will be possible to place it with certainty.

TYTTHUS MONTANUS n. sp.

Characterized by its colour, shape of pronotum and male genitalia.

Male: length 2.7 mm. width 0.8 mm. *Head*: length 0.2 mm., width 0.6 mm., vertex 0.33 mm. *Antennae*: segment I, length 0.2 mm.; II, 0.9 mm.; III, IV, broken. *Pronotum*: length 0.4 mm., width at base 0.7 mm.

Castaneous to dark brown; head, pronotum and scutellum (except pale areas on vertex) dark brown; antennae pale yellow, second and two last joints fuscous towards apex; hemelytra greyish brown with basal third whitish to pale yellow, membrane paler towards apex; underside of body castaneous, legs pale yellow except bases of coxae which are reddish and apical portion of femora (especially hind pair) which are castaneous to dark brown, tibiae slightly darker towards base.

Rostrum reaching the base of hind coxae. Head rounded in front, clypeus not seen from above, eyes placed near middle of head, distant from pronotum by a space equal to thickness of first antennal segment, pronotum noticeable constricted behind middle, disc convex, smooth, calli larger but not marked, lateral margins broadly rounded and converging anteriorly, posterior margin sinuate internally, humeral angles rounded; pubescence scanty and short, mesoscutum broadly exposed.

Genitalia: aedeagus of the common Phyline type. Left clasper (fig. 7 C, F) as seen in figures, the longer arm with many hairs on external margin. Right clasper (fig. 7 B, D) somewhat laminate, as shown in figures.

Female: unknown.

Holotype: male, Drummond, Montana, Oman col., VII. 935, in the collection of the U.S. National Museum.

This species shows a peculiar pronotum but still can be mantained in the genus *Tytthus* Fieber, since the position of the eyes and shape of pronotum varies within the genus. It differs from the others known so far in the colour and the above mentioned characters.

TYTTHUS PANAMENSIS n. sp.

Characterized by its size, colour and male genitalia.

Male: length 2.4 mm., width 0.6 mm. *Head*: length 0.2 mm., width 0. 4 mm., vertex 0.23 mm. *Antennae*: segment I, 0.2 mm.; II, 0.9 mm.; III and IV, broken. Pronotum: length 0.2 mm., width at base 0.5 mm.

Head, pronotum and first antennal segment (except extreme apex) black to dark brown; remaining antennal segments, apices of femora and bases of tibiae castaneous to fulvous; hemelytra pale to greenish yellow, membrane translucent; rostrum, coxae (except for reddish tinge on first pair), bases of femora and apices of tibiae, pale yellow; underside of body (except median portion of abdomen) dark brown to castaneous; the light spots on head obsolete.

Rostrum reaching base of hind coxae, body elongate, hemelytra parallel sided.

Genitalia: aedeagus of the common Phyline type. Left clasper (fig. 7 G) as seen in figure. Right clasper (fig. 7 E) with a long setae on truncate apex.

Female: unknown.

Holotype: male, Corozal, C. Z. Panama, A. Buesk col. (at light).

Paratypes: 3 males, same data as the type, in the collection of the U.S. National Museum and of the author.

This species is near *parviceps* in colour but with more elongate body, the spots on vertex obsolete and a typical left clasper. From *balli* and *alboornatus* it differs in colour and structure of claspers.

GENUS FIEBEROCAPSUS nov. gen.

Head rounded anteriorly, face short, distance from base of eye to apex of tylus half height of eye; antennae with the first and second segments at least half as broad again as the third and fourth; pronotum trapezeform, straight sided and only slightly wider posteriorly than anteriorly (Fig. 10), its lower margin usually slightly concave, calli only slightly raised; hemelytra with the cuneus broader than long; covered with pale semi-erect hairs, longer (average 0.12 mm.) on head and anterior of pronotum and shorter on hemelytra and legs (average 0.08 mm.), occasional spinose hairs on hind tibia, rostrum reaching to apex hind coxa. Genitalia comparatively large, the left clasper simple and curved, the right rounded with a median row of the teeth; the vesica of the aedaegus has a pair of appendages arising from near its apex, as well as the more basal vesical appendage; in the female the K structure is large and its posterior median concave. Brachypterism occurs in both sexes.

Type species: *Tytthus flaveolus* Reuter 1870.

Although superficially similar to *Cyrtorhinus* and *Mecomma*, this genus is sharply distingueshed from them on genitalia, in the structure of these it shows affinities with *Cyllecoris* Hahn and *Dryophilocoris* Reuter.

FIEBEROCAPSUS FLAVEOLUS (REUTER) nov. comb.

Tytthus flaveolus Reuter, Not. Sallsk. F. Fl. Fenn. 11: 323, pl. 1, fig. 6, 1870.

* *Tytthus insignis* Reuter nec Douglas & Scott, Rev. Crit. Caps. 2: 126, 1875 (syn. by Reuter, Ent. mon. Mag. 14: 131, 1877).

Cyrtorhinus flaveolus Reuter, Hem. Gymn. Eur. 3: 380, 554, 1883; Saunders, Hem. Het. Brit. Is.: 284, 1892; Wagner, Tierw. Deut. 41, Blindw.: 128, 1952.

(Fig. 10 A-H)

Characterized by its shape, colour and genitalia.

Male: *Brachypterous*: lengh 2.8 mm., width 1.50 mm.; head, width 0.94 mm., vertex 0.40 mm.; antennae, segment I, length 0.44 mm., II 1.2 mm., III 0.75 mm., IV 0.5 mm.; pronotum, length 0.52 mm., width 0.97 mm.; rostrum 1.3 mm.

Entirely pale yellow except for antennae, the first and second segments of which are brown with pale backs, whilst the third and fourth segments are pale grey-brown; the tylus is dark brow as are two areas on the frons (to which the feeding pump muscles are attached); lateral region of pronotum and meso—and meta—thoracic pleurites suffused with brown, tip of rostrum dark brown.

Pubescence of pale fine adpressed hairs. Brachypterous, hemelytra reaching just beyond posterior of eighth segment, membrane and cuneal suture absent.

Genitalia: aedeagus (fig. 10 B) of orthotyline type with straplike tooth vesical appendages; left clasper (fig. 10 D, E) narrow, its apex produced and grooved; right claspers (fig. 10 A) broad with a central toothed shelf-like projection.

Macropterous: length 3.5 mm., width 1.47 mm.; pronotum, length 0.52 mm., width 1.15 mm.; otherwise as in brachypterous male.

Female: *brachypterous*: length 2.97 mm., width 1.75 mm.; head, width 0.94 mm., vertex 0.45 mm.; antennae, I 0.43 mm., II 1.15 mm., III 0.72 mm., IV 0.5 mm.; pronotum, length 0.5 mm., width 1.12 mm.; rostrum length 1.28 mm.

Colour and pubescence as in male.

Genitalia: K structures shaped in a curved L, quite distinct from any other species (fig. 10 F).

Macropterous: length 3.75 mm., width 1.75 mm.; pronotum, length 0.62 mm., width 1.35 mm.; otherwise as in brachyterous female.

Distribution: England, Sweden, Finland, Denmark, N. Russia, Germany.

Specimens studied: 6 ♂ 6 ♀ Houdslow Heath, Middlesex, U.K, 20/7/53, G. E. Woodroffe, 1 ♂, Finland, Aug. 1947, R. Linnavuori; 1 ♀ Finland.

This species is easily recognised by its entirely pale coloration. The adult, which is found from July to September (Butler, 1923), is said to be phytophagous (Wagner, 1952) (see however p. 64). It is found at the bases of reeds and rushes; the brachypterous form is the commonest.

GENUS CYRTORHINUS FIEBER

Cyrtorhinus Fieber, Wien. Ent. Monat. 2: 313, 1858; Reuter, Hem. Gymn. Eur. 3: 379, 1883; Distant, Faun. Brit. Ind. Rhync. 2: 476, 1904; Hueber, Syn. Blindw. 2: 106, 1908; Poppius. Acta Soc. Sci. Fenn. 44 (3): 70, 1914; Wgner, Tierw. Deut 41, Blindw.: 127, 1952.

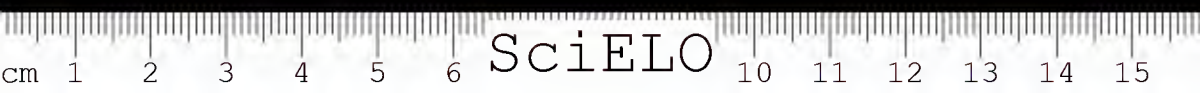
* *Cyrtorrhinus* Reuter, Acta Soc. Sci. Fenn. 13: 379, 1884 (emendation).

* *Reuteriessa* Usinger, Soc. Sci. Fenn. Comment. Biol. 12 (8): 3, 1951 (*nov. syn.*).

Type species: *Capsus elegantulus* Meyer, 1843, a synonym of *Cyrtorhinus caricis* (Fallen, 1807) — monobasic.

Small to medium sized bugs (2.5-4.5 mm), haed rounded anteriorly, face semi-vertical; antennae arising adjacent to anterior margin of eyes; pronotum campanuliform with calli slightly raised, its lower margin straight; posterior of pronotum slightly wider than head; opening of odiferous gland raised; pretarsus with flaplike arolia; rostrum reaching base of mid-coxa; male pygophore with subgenital plate or adeagal support only slightly projecting; bursa copulatrix of female with rounded or semi-quadrate K structures. Covered with simple semi-erect pubescence (0.08-0.15 mm. in length;) colour pattern generally black and pale green. Female sometimes partially brachypterous.

KEY TO THE SPECIES OF *CYRTORHINUS*

1. Second antennal segment about twice as long as pronotal width at base (1.5 : 0.8) 2
   Second antennal segment noticeably less than twice as long as pronotal width at base (1.5 : 1.0 to 0.8 : 0.7). 3

2. Colour chiefly fulvous, apex of first antennal segment pale .. .. *fulvus* Knight
Colour pale yellow green, apex of first antennal segment dark .... *cumberi* Woodward
3. Second antennal segment half as long again as width of pronotum at base (1.5 : 1.0 mm.), right clasper of male not bifid, basal segment of antennae entirely black; pronotum and scutellum entirely black, head black with only two small pale areas adjacent to the eyes .... *caricis* (Fallen)
Second antennal segment only slightly longer than the pronotum is wide at its base (0.8 : 0.7 mm. or 1.18 : 0.93 mm.), right clasper of male bifid, basal segment of antennae pale at apex; (pronotum and scutellum often partially pale; head generally with wide pale areas adjacent and posterior to the eyes) 4
4. Small species (under 3.0 mm.), tibiae entirely yellow .... *lividipennis* Reuter
Larger species (over 3.5 mm.), tibiae generally infuscate especially at base .... *melanops* Reuter

CYRTORHINUS CUMBERI WOODWARD

Cyrtorhinus cumberi Woodward, Rec. Auck. Inst. Mus. 4 (1): 9-23, 1950.

(Figs. 11 A-G)

Characterized by its long second antennal segment, pale coloured pronotum of the male and genitalia.

Male: length 3.85 mm., width 1.0 mm.; head, width 0.75 mm., vertex 0.4 mm.; antennae, segment I, length 0.5 mm., II 1.5 mm., III 1.34 mm., IV 0.55 mm.; pronotum, length 0.48 mm., width 0.84 mm.; rostrum length 1.0 mm.

Pale yellow green, except antennae (apart from extreme base of first segment), anterior and lateral regions of head, lateral area of thorax and apices of tarsi and rostrum which are black.

Pubescence pale and fine; macropterous.

Genitalia: aedeagus fig. 11 E) of orthotyline type, the theca with a dorsal projection and the vesical appendage truncate at its apex; right clasper (fig. 11 C) with a curved process which is toothed at its apex, left clasper (fig. 11 D) with a long simple curved process.

Female, Brachypterous: length 3.84 mm., width 1.25 mm.; head, width 0.78 mm., vertex 0.40 mm. Antennae, I 0.5 mm., II 1.33 mm., III 1.07 mm., IV 0.55 mm.; pronotum, length 0.5 mm., width 0.85 mm.; rostrum length 1.1 mm.

Head red with anterior and lateral regions black and two areas on the vertex, median to the eyes, yellow; antennae with basal joint red, second red-brown becoming darker at apex; pronotum yellow-green suffused with red and anterior and lateral regions black; legs and scutellum yellow green; hemelytra pale green; underside yellow-green; tip of rostrum dark.

Pubescence as in male; brachypterous, hemelytra reaching to end of seventh abdominal segment, membrane much reduced.

Genitalia: K structures (fig. 11 G) semi quadrate.

Macropterous not seen, based on Woodward (1950): length 3.6 mm., width 1.3 mm. As brachypterous female but hemelytra reaching, but not entirely covering the ninth tergite.

Distribution: New Zealand (N. Island).

Specimens studied: 1 ♂, Paiaka, Manawatu, New Zealand, 2/2/51, T. E. Woodward (B. M.); 4 ♀, ditto, New Zealand, 4/1/50, T. E. Woodward (B. M.).

This species is very similar to *fulvus* Knight in proportions, but is distinguished by its coloration and genitalia. It was found below and in tufts of rushes and grasses, where Delphacids occurred abundantly (Woodward, 1950).

CYRTORHINUS FULVUS KNIGHT

Cyrtorhinus fulvus Knight, Ins .Samoa, II, Hem. 5: 205, 1935.
Cyrtorhinus fulvus Zimmerman, Ins. Hawaii, 3, Heteropt.: 205, fig. 8, 1948.

(Fig. 12 A-E, G-H)

Characterized by its colour, size, length of second antennal segment and genitalia.

Male: length 3.4 mm., width 1.0 mm.; head, length 0.2 mm., width 0.7 mm., vertex 0.34 mm.,; antennae, segment I, length 0.4 mm., II 1.5 mm., III 1.3 mm., IV 0.6 mm.; pronotum, length 0.4 mm., width at base 0.8 mm.; rostrum, length 1.1 mm.

General colour fulvous, antennae except apex of segment I, head except on vertex and genae and lora, pronotum except median ray on basal half of disc, mesonotum more or less, and median line of scutellum, black; legs fulvous, fuscous on knees; membrane pale to dusky, cubitus fuscous.

Rostrum reaching the middle coxae. Genitalia with aedeagus showing a typical spiculum (fig. 12 B). Left clasper (fig. 12 D) branched at middle, the lower arm curved, the upper lobe with dorsal setae. Right clasper (fig. 12 C, H) also branched, one lobe with setae, the other ended by a serrate margin. Pygophore (fig. 12 G) as seen in figure.

Female: length 3.8 mm., width 1.3 mm., slightly more robust than male but very similar in structure and colouration. K structure as seen in figure 12 E.

Distribution: Micronesia, Caroline Is. (Palau, Babelthuap, Yap, Koror), Samoa, Java, Philippines, Fiji, New Guinea (Introduced into Hawaii).

Specimens studied: 1 ♂ (Holotype) Savaii, Samoa, Lower forest (1000-2000 ft.), E. H. Bryan (Brit. Mus.); 3 ♂ (Paratypes) Savaii, Samoa, E. H. Bryan (Brit. Mus.); 2 ♀ (Paratypes) Malololedei, Upolu, Samoa 1/5/24, P. A. Buxton and G. H. Hopkins (Brit. Mus.); 2 ♀ Suva, Fiji, 7/5/43, R. A. Lever; 3 ♂ New Guinea, Pemberton col.; 1 ♂ Java, F. Muir col.; 1 ♀ Los Banos, Philippine Ils. F. Muir col.; 1 ♂ Honolulu, Hawaii; 9 ♂ 41 ♀, CAROLINE ILS., *Palau*: Babelthuap Is., 7/12/52, J. L. Gressit; *Yap Group*: Yapid, Colonia, Konil, S. Yapid, Tomil Dist., July 1950, R. J. Goss, Koror: 30/11/47, H. S. Dybas; 15/3/48 K. L. Maehler; 26/1/53, L. W. Beardsley; *Babelthuaup*: Kaishan, Aug. 1939, T. Esaki.

CYRTORHINUS LIVIDIPENNIS REUTER

Cyrtorhinus lividipennis Reuter, Ent. Tidskr. 5: 199, 1884; Distant, Faun. Brit. Ind. Rhync. 2: 476, fig. 308, 1904.

* *Cyrtorhinus vitiensis* Usinger, Soc. Sci. Fenn. Comm. Biol. 12 (8): 3, figs. 1, 2, 1951 (nov. syn.).

(Figs. 12 F, 13 A-G)

Characterized by its size, length of second antennal segment and genitalia.

Male: length 2.50-2.78 mm., width 0.95 mm.; head, width 0.6 mm., vertex 0.27 mm.; antennae, segment I, length 0.3 mm., II 0.86 mm., III 0.78 mm., IV 0.52 mm.; pronotum, length 0.33 mm., width 0.78 mm.; rostrum length 0.75 mm.

Head, pronotum and scutellum pale yellow with a variable amount of black or dark brown markings, ranging from almost entirely dark to entirely light; antennae dark except for apex of basal and base of segment; hemelytra pale green, membrane pale grey with nervures grey-green; legs pale yellow; rostrum pale green, tip dark; underside of thorax, and all abdomen pale yellow-green.

Pubescence of short pale adpressed hairs. Macropterous.

Genitalia: aedeagus (fig. 12 F, 13 C) of orthotyline type, the single vesical appendage sharply widened on one side and then narrowing again before the tip; left clasper (fig. 13 F) with an elongated curved arm with three teeth on th eventral aspect, as in *fulvus;* the right clasper (fig. 13 H, G) with a short curved process.

Female: length 2.75-3.0 mm., width 1.1 mm.; head, width 0.63 mm., vertex 0.34 mm.; antennae, I 0.26 mm., II 0.78 mm., III 0.74 mm., IV 0.58 mm.; pronotum, length 0.33 mm., width 0.85 mm.; rostrum length 0.76 mm.

Colour and pubescence as in male. Macropterous.

Genitalia: K structures (fig. 13 D) curved.

Distribution: S. India, Ceylon, Burma, Gt. Nicobar, China, Formosa, Japan, Philippine Ils., Java, Sumatra, New Guinea, Marianas Ils. (Guam, Rota), Caroline Ils. (Yap, Babelthuap, Koror, Yapid), Samoa, New Hebrides (Malekula), Borneo.

Specimens studied: 1 ♂ (Holotype of *vitiensis* Usinger) Dobuilevu, Fiji (sweeping young rice), 15/6/48, B. A. O'Conner (Brit. Museum); 2 ♂ Dobuilevu, Fiji (sweeping young rice), 15/6/48, B. A. O'Conner; 10 ♂, 9 ♀ Nadurolonlou, Fiji, (sweeping young rice), 16/10/50, B. A. O'Conner; 1 ♂ 2 ♀ Mokassan, Chekiang, China, Dora E. Wright; several ♂, ♀ San Joe, Mindoro, Philippine Ils., March 1945, E. S. Ross; Los Banos, Philippine Ils., October 1945, G. B. Viado; 1 ♂ New Guinea, Pemberton col.; 1 ♂ Malekula, Malua Bay, New Hebrides May 1929, L. E. Cheesman; 25 ♂ 43 ♀ MARIANAS ILS., *Guam*: Pt. Oca, Agana May June and July 1945, G. E. Bohart and J. L. Gressit; *Rota*: 22/6/52 Y. Kondo; CAROLINE ILS., *Yap Group*: Yap Is., Oct. 1952, N. L. H. Krauss; Hill behind Yaptown, 29/11/52, J. L. Gressitt, *Babelthuap*: Ulimang, 25/12/47 H. S. Dybas, 23/5/53 Oller; *Yafid*: Colonia, July 1950 R. J. Goss; *Koror*: July 1953, J. W. Beardsley, Sandakan, Borneo, Pemberton col.; Fly River, New Guinea, Pemberton col.

This species is near to *fulvus* Knight but differs in the shorter second antennal segment, less tumid calli, coloration, smaller size and in the structure of the male genitalia, whilst the two latter characters distinguish it from *melanops* Reuter.

Usinger (1939) found this species associated with *Peregrinus maidis* (Ashmead) on corn, the eggs of the fulgorid apparently being its preferred food. It was also common on rice where it preyed upon the eggs of *Nilaparvata lugens* (Stal). According to Usinger (1946) *lividipennis* Reuter was introduced into the Hawaiian Islands recently in an effort to control the corn leafhopper but did not become established. Zimmerman (1948) says that the species was introduced from Guam into Hawaii by the Board of Agriculture and Forestry, in 1939, and confirms the fact that it did not become established.

CYRTORHINUS MELANOPS REUTER

Cyrtorhinus melanops Reuter, Ofv. F. Vet. Soc. Forh. 47 (2): 6, 1905.

* *Cyrtorhinus megalops* Poppius, Acta Soc. Sci. Fenn. 44 (3): 71, 1914 (error pro *melanops* Reuter).

(Figs. 14 A-J)

Characterized by the wide pale area adjacent to the eyes in the male and the genitalia.

Male: length 3.8 mm., width 1.2 mm.; head, width 0.73 mm., vertex 0.37 mm.; antennae, I 0.3 mm., II 1.18 mm., III 1.0 mm., IV, broken; pronotum, length 0.45 mm., width 0.93 mm.; rostrum length 1.15 mm.

Type: Yellow-green apar from anterior of head, basal segment of antennae (except extreme base and apex) black-brown, second antennal segment light brown, paler in the centre, hind tibia with pale brown mark a third length from the apex, apical segment of tarsus and claws ligth brown.

Other specimens: Head black with two wide pale areas adjacent to the eyes, stretching from just posterior to the base of the antennae to the posterior margin of the vertex; antennae black-brown with the extreme base and apex of the basal segment pale; pronotum and scutellum entirely black-brown; hemelytra yellow-green, claval suture slightly infuscate, membrane pale, nervures, pale green; legs pale green, with extreme base of the tibia brown, the hind tibia sometines entirely pale brown, with the base darker, apex of tarsus and claws brown; underside and abdomen brown-black rostrum pale green, tip dark.

Pubescence pale and fine, macropterous.

Genitalia: aedeagus with a single vesical appendage (fig. 14 J), left clasper bifid, lower arm curved (figs. 14 F, G), right clasper also bifid, its lower arm with inwardly curved teeth apically (figs. 14 H, I).

Female: length 3.88 mm., width 1.21 mm.; head, width 0.77 mm., vertex 0.38 mm.; antennae, segment I, length 0.32 mm., II 1.19 mm., III IV broken; pronotum, length 0.5 mm., width 0.98 mm., rostrum length 1.17 mm.

Generally similar in coloration to male, but pale areas adjacent to eyes sometimes very small and clavus infuscate; abdomen pale green with dorsum brown or entirely fuscous.

Distribution: "Caffrorca" [Natal], Abyssinia.

Specimens studied: Type, 1 ♂, "Caffrorca" (Riksmuseum, Stockholm), 3 ♂ 1 ♀ Hawash River, W. of Mount Zaquala (c. 6,000 ft.), Abyssinia, 28/11/26, J. Omer Cooper (B.M.); 1 ♂ Serpent Lake, Wouramboulchi, (c. 9,000 ft.) Abyssinia, 5/10/26, J. Omer Cooper (B. M.); 1 ♀ nr. Addis Allem (c. 8,000 ft.), Abyssinia, 19/9/26, J. Omer Cooper (B. M.); 1 ♀ Natal, Brown col.

Although the other specimens are much darker in colouration than the type, examination of the genitalia left no doubt that they were the same species. On genitalia and other characters it is closest to *lividipennis* Reuter, but is distinguished from this species on size, and from *caricis* (Fallen) by the pale areas on its head, the pale apex of the basal antennal segment and genitalia.

CYRTORHINUS CARICIS (FALLEN)

Capsus caricis Fallen, Mon. Cimic. Suec.: 102, 1807.

Lygus caricis Vollenhoven, Hem. Het. Neerl.: 228, pl. 16, fig. 4, 1878.

Cyllecoris caricis Hahn, Wanz. Ins. 2: 100, fig. 184, 1834.

Cyrtorhinus caricis Reuter, Hem. Gymn. Eur. 3: 383, 555, pl. 1, fig. 10, pl. 2, fig. 3, 1883; Saunders, Hem. Het. Brit. Is.: 283, pl. 26, fig. 5, 1892; Stichel, Illus. Best. Deut. Wanz. 8: 227, figs. 590, 591, 1933; Wagner, Tierw. Deut. 41, Blindw.: 127, 1952.

• *Capsus elegantulus* Meyer-Dür, Verz. Schw. Rhync.: 86, pl. 5, fig. 2, 1843 (syn. by Thomson, Opusc. Ent. 4: 437, 1871).

Sphyracephalus elegantulus Douglas & Scott, Brit. Mem.: 351, 1865.

• *Capsus chloropterus* Herrich-Schaeffer, Wanz. Ins. Verz.: 34, 1853 (syn. by Reuter, Hem. Gymn. Eur. 3: 383, 1883).

(Figs. 15 A-H)

Characterized by the entirely black antennae and the genitalia.

Male: length 4.1 mm., width 1.25 mm.; head, width 0.85 mm., vertex 0.35 mm.; antennae, segment I, length 0.45 mm., II 1.50 mm., III 1.20 mm., IV 0.53 mm.; pronotum, length 0.5 mm., width 1.0 mm.; rostrum length 1.2 mm.

Head black, except for two triangular areas on the vertex adjacent to the eyes, pale green; antennae entirely black; pronotum and scutellum black; hemelytra pale green with clavus and median area of corium suffused with dark brown, nervures brown; legs pale green with apex of tarsi dark; rostrum pale tip dark; underside of head and thorax black; abdomen pale green.

Pubescence pale and fine; all specimens seen macropterous.

Genitalia: aedeagus (Fig. 15 H) of orthotyline type, with the single vesical appendage curved at its apex; left clasper (Fig. 15 D, E) with process simply curved; right clasper (Fig. F) simple truncate slightly curved, teeth of dorsal area not raised on a process.

Female: length 4.0 mm., width 1.45 mm.; head, width 0.85 mm., vertex 0.38 mm.; antennae, I 0.45 mm., II 1.22 mm., III 1.0 mm., IV 0.53 mm.; pronotum, length 0.5 mm., width 1.0 mm.; rostrum length 1.1 mm.

Coloration and pubescence as in male. Macropterous.

Genitalia: The K structures are small semiquadrate with the inner posterior corner elongated (Fig. 15 G).

Distribution: Ireland, Scotland, Wales, England, Netherlands, France, Switzerland, Hungary, Denmark, Norway, Sweden, Finland, European Russia (incl. Caucasus), Siberia, Turkestan.

Specimens studied: 1 ♂ Saunders coll.; 2 ♂ 1 ♀ Houndslow Heath, Middlesex, U. K. 20/7/53, G. E. Woodroffe, 2 ♀ Wimbledon Common, Surrey, England, 8/10/51, T. R. E. Southwood; 2 ♀ Aviemore, Scotland, August 1938, A. M. Massee; 1 ♂ Piesting, Lower Austria; 1 ♀ Colorado, Uhler col.; Several ♂ and ♀, Wrangel, Alaska, B. Malkin, VII. 951.

This large species is similar in appearance to *melanops* Reuter, but its entirely black antennae, small pale areas on the head and genitalia distinguish it. It is found at the bases of rushes (*Juncus*) and sedges (*Carex, Scirpus*), as an adult between June and October. The winter is passed in the egg state and the young nymphs hatch the following spring (Butler 1923, Kullenberg 1946). The eggs, which are sausage-shaped with their micropylar end strongly curved, are laid in the leaves or stems of various *Scirpus* spp. (Kullenberg 1943, 1946) (Fig. 22).

Most of the American records for this species are to be referred to *Tytthus vagus* Knight (*Cyrtorhinus caricis vagus* Knight, 1923), a species of Phylini. Several specimens labelled as *caricis* in American collections and seen by the senior author do not possess the convergent arolia of the Orthotylini. *C. caricis* (Fallen) is apparently rare in the United States where it seems to be restricted to the Rocky Mountain range.

GENUS *MECOMMA* FIEBER

Mecomma Fieber, Wien. Ent. Monat. 2: 313, 1858; Reuter, Herm. Gymn. Eur. 3: 383, 545, 1883; Hueber, Syn. Blidw. 2: 166, 143, 1908; Poppius, Acta Soc. Sci. Fenn. 44 (3): 60, 72, 1914; Wagner, Tierw. Deut. 4, Blindw.: 110, 129, 1952.

* *Sphyracephalus* Douglas & Scott, Brit. Hem.: 348, 1865.
* *Sphyrops* Douglas & Scott, Ent. Mon. Mag. 3: 16, 1866 (nom. nov. for *Sphyracephalus* Douglas & Scott, 1865).
* *Antiphilus* Distant, Ann. Mag. Nat. Hist. (8) 4: 521, 1909 (syn. by Carvalho, An. Acad. Brasil. Ci., 24 (1): 78, 1952).
* *Aristobulus* Distant, Ann. Mag. Nat. Hist. (8) 5: 16, 1910 (n. syn.).
* *Nycticapsus* Poppius, Acta Soc. Sci. Fenn. 44 (3): 74, 1914 (n. syn.).
* *Aristobolus* Carvalho, An. Acad. Brasil. Ci. 24 (1): 79 (error pro *Aristobolus* Distant).

Type species: *Capsus ambulans* Fallen, 1807 — monobasic.

Males always fully winged medium sized bugs (4-5 mm.), females usually brachypterous (2.0-3.5 mm.), occasionally fully wingend. Head roundde anteriorly; face vertical, depth from base of eyes to apex of tylus about half the vertical diameter of the eyes, antennae arising adjacent to lower median corner of the eyes, basal and second antennal segments markedly thicker than third and fourth; pronotum campanuliform with narrow anterior collar and in the male strongly raised posteriorly; in the males heald width including eyes nearly twice as wide as pronotal collar and subequal to the width of the base of the pronotum; opening of odoriferous sac raised; pretarsus with flap-like arolia; rostrum reaching beyond base of hind coxa; male pygophore with subgenital plate or aedeagal support only slightly projecting; left clasper strongly curved, right clasper with a ridge of teeth, aedeagus with single vesical appendage and vesica curved dorsally just before gonopore; bursa copulatrix of female with rounded to conical K structures; covered with simple semi-erect

pubescence (0.10-0.18 mm.), usually longer in the male; general colour of males light brown and black and in females brown and black or almost entirely brown.

Mecomma is closest to *Cyrtorhinus* in general fascies and in the structure of the genitalia of both sexes. It differs however in the following characters: the female is usually brachypterous, the outline of the male is almost parallel sided, the rostrum reaches beyond the base of the hind coxa, the pubescence is long (usually over 0.15 mm.), the cuneus is long (in the male twice as long as wide), the left clasper is strongly curved and unbranched, the right clasper has an apical row of spines and a spineless ventral process, the vesica is curved upwards just before the gonopore and the K structure of the bursa copulatrix has its posterior margin produced almost to a point.

Species of *Mecomma* occur amongst grasses (generally damp) in or around temperate forests. Hence in tropical regions (e.g. India) *Mecomma* sp. are present only in mountainous districts, where these conditions are found; this results in geographical isolation, followed by subspeciation. Subspeciation has also occured in the Nearctic region. It seems that the isolating effect of the geographical barriers are strengthened by the brachypterism common in the female. One species is polymorphic.

The striking convergence between the allied Orthotyline genus *Cyrtorhinus* and the Phyline genus *Tytthus* has already been noted; a similar convergence in both sexes occurs between *Mecomma* and the phyline genus *Orthonotus* which in habits similar situations.

A further study of *Mecomma* with more material and ecological data would be of great interest, intrinsically and from the more general aspect of speciation.

KEY TO THE SPECIES OF *MECOMMA* FIEBER

Females: (at present known)

1. Second antennal segment distinctly clavate, elytra reaching only to second abdominal segment .... *mimetica* n. sp.
   Second antennal segment if incrassate towards apex, not clavate, elytra reaching posterior margin of third abdominal segment or beyond 2
2. Elytra entirely black 3
   Elytra pale or if infuscate, yellowish at base or margins .. 7
3. Pronotum noticeably broader posteriorly than anteriorly (Figs. 22 B, A), segment two of antennae entirely black 4
   Pronotum only slightly broader posteriorly than anteriorly

(Figs. 17 A, B; 20 A) segment two of antennae at least partially pale 6

4. Antennae entirely black .... *amicus* (Distant)
Antennae partially pale 5

5. Basal segment of antenna pale .... *chinensis* Reuter
Basal segment of antennae black, the third partially pale .. .. *ambulans* (Fallen)

6. Second antennal segment dark at apex, upper surface of pronotum and hemelytra shining .... *orientalis orientalis* n. sp. form a
Second antennal segment entirely yellow, upper surface of pronotum and hemelytra rugose .... *orientalis orientalis* n. sp. form b

7. Antennae entirely black, larger species ...... *grandis* n. sp.
Antennae partially pale or brown 8

8. First antennal segment black or fulvous 9
First antennal segment pale 10

10. Antennae usually castaneous to fulvous; K structure as in fig. 20 J .... *antennata* Van Duzee
Antennae black; K structure as in fig. 20 F .... *gilvipes* (Stal)

11. Pronotum and scutellum unicolorous .. *luctuosa* (Provancher)
Pronotum with a longitudinal fascia and apex of scutellum pale .... *melanocephalus* (Poppius)

Males: (known at present)

1. Pronotum and first antennal segment castaneous to fulvous .... *antennata* Van Duzee
Pronotum black, first antennal segment black or pale 2

2. Third antennal segment partially pale 3
Third antennal segment black 4

3. Basal antennal segment pale, cuneus long (0.70-0.81 mm), head narrow (0.68-0.71 mm) ...... *orientalis* n. sp. *orientalis* for a
Basal antennal segment dark or pale, cuneus short (0.60-0.62 mm), head wide (0.73-0.78 mm) .... *orientalis hymalayensis* n. subsp.

4. Antennae black 5
Antennae with first segment pale 8

5. Apices of corium and cuneus pale to ochraceous 6
Apices of corium and cuneus suffused with black 7

6. Endocorium black .... *madagascariensis* Reuter
Endocorium translucent, pale ..*luctuosa luctuosa* (Provancher)

7. Larger, head width 0.83-0.87, right clasper as in fig. 21 E spiculum as in fig. 21 F .... *ambulans* (Fallen)
Smaller, head width 0.79-0.83 mm, right clasper as in fig. 19 B, C spiculum as in fig. 19 D .... *amicus* (Distant)
8. Genitalia as in figs. 17 G, F ......*orientalis orientalis* form b
Genitalia as in figs. 21 A, I .... *luctuosa pacifica* n. subsp.

MECOMMA ORIENTALIS n. sp.

(Figs. 17 A-H)

Characterized by the pronotum of the female only slightly wider posteriorly than anteriorly, the partially pale coloured antennae, the general proportions and genitalia.

[Note: forms a and b of the female may not correspond with the respective forms in the male and hence an allotype has not been designated].

Subspecies *orientalis* nov. sp. Form a (type form)

Male, Holotype: length 4.25 mm., width 1.25 mm.; head width 0.68 mm., vertex 0.32 mm., antennal segment I, length 0.38 mm., II 1.48 mm., III 1.12 mm., IV 0.40 mm.; pronotum length 0.47 mm., width 0.92 mm.; rostrum length 1.39 mm.; cuneus length 0.80 mm.

Head black, antennae with the first segment yellow brown, the second black, the third pale yellow with its apical half black-brown, the fourth black-brown; pronotum and scutellum black; hemelytra light brown with clavus, inner margin and angle of corium darker, outer angle of corium and apex of cuneus dark brown; legs yellow-red, with base of coxa black, and apex of tarsi darker; abdomen and underside entirely black.

Pubescence of fine semi-erect hairs. Macropterous.

Genitalia: aedeagus of orthotyline type with a single vesical appendage (Fig. 17 F), this is not bifid at the apex; right clasper with ventral process curved posteriorly (Figs. 17 C, E); left clasper strongly curved (Fig. 17 D, I) slightly more so than in *amicus* and with dorsal corner of basal region slightly produced.

Other specimens: length 4.0-4.4 mm.; width 1.20-1.29 mm. (for other measurements see Table I).

Coloration only differing in that of third antennal segment which may be pale with only extreme base and apex dark or variations between this and the condition in the Holotype, but always at least half pale.

Specimens studied: 1 ♂ (Holotype) South India, T. V. Campbell (British Museum); 17 ♂ (Paratypes) South India, T. V. Campbell (British Museum): 3 ♂ Kodai-Kanal, S. India, T. V. Campbell; 1 ♂ Chikballapur, Mysore, Jan. 1915, T. V. Campbell.

Form b

Male: length 4.05 mm., width 1.15 mm.; head width 0.72 mm., vertex 0.31 mm.; antennae, segment I, length 0.37 mm., II 1.23 mm., III 0.96 mm., IV 0.48 mm.; pronotum, length 0.50 mm., width 0.85 mm., rostrum length 1.33 mm.; cuneus length 0.64 mm.

Similar to form a in general coloration, but differing in having the third antennal segment entirely black and the apices of the corium and cuneus often paler, also in the shorter cuneus and antennae and the narrower base of the pronotum. The genitalia are virtually identical with those of form a.

Specimens studied: 3 ♂ South India, T. V. Campbell; 1 ♂ Kodai-Kanal, S. India (7 000 ft.) 24/3/36; 7 ♂ Nilgiri Hills., S. India, T. V. Campbell.

Form a, Female: length 2.40 mm., width 1.4 mm.; head width 0.70 mm., vertex 0.33 mm.: antennae, segment I, length 0.34 mm., II 1.20 mm., III 0.83 mm., IV 0.33 mm.; pronotum, length 0.42 mm., width 0.71 mm.; rostrum length 1.42 mm.; hemelytra width 0.72 mm.

Head black with two areas adjacent to the eyes slightly paler; antennae, basal segment dark or pale, second segment with basal two thirds yellow, apex black, third segment basal third pale, apex and fourth segment dark brown; pronotum and scutellum black; hemelytra black with extreme humeral angle slightly paler; legs yellow—fulvous with apical segment of tarsus dark and coxa, at least their base black; abdomen black with extreme margin of connexivum pale; rostrum fulvous, its basal and apical segments dark brown or black.

Upper surface smooth and shining, especially on hemelytra where the only markings are those of the alveoli, from which arise pale semi-erect hairs of medium length. Brachypterous.

Genitalia: K structure of bursa copulatrix as in Fig. 17 H.

Specimens studied: 2 ♀ Lovedale, S. India, T. V. Campell; 2 ♀ Nilgiri Hills, S. India, T. V. Campbell.

Form b, Female: length 2.48 mm.; width 1.38 mm.; head, width 0.75 mm., vertex 0.32 mm., antennae, segment I, length 0.29

mm., II 0.98 mm., III 0.75 mm.; pronotum, length 0.45 mm., width 0.75 mm., rostrum length 1.43 mm., hemelytra width 0.74 mm.

Coloration as in form a except for antennae which are yellow with the apical two thirds of the third segment and the whole fourth segment fuscous.

Whole of upper surface strongly rugose; covered with semi-erect hairs of medium length. Brachypterous.

Genitalia: K structure slightly less curved than in form a (Fig. 17 G).

Specimens studied: 3 ♀ Lovedale, Nilgiri Hills, S. India (7,200 ft., "very common in grass"), T. V. Campbell; 2 ♀ Nilgiri Hills, South India, T. V. Campbell.

Distribution of M. orientalis orientalis: the only definite localities are the Nilgiri Hills and the Cardamon Hills in S. W. India.

Sub-species himalayensis nov. subsp.

Male, Holotype: length 4.38 mm., width 1.10 mm.; head width 0.73 mm., vertex 0. 33 mm.; antennae segment I, length 0.39 mm., II 1.29 mm., III 0.98 mm., IV 0.40 mm.; pronotum length 0.48 mm., width 0.88 mm.; rostrum length 1.25 mm.; cuneus length 0.62 mm.

Head black, two slightly paler areas on the vertex adjacent to the eyes; antennae with basal segment yellow, second segment black, third with basal third pale, rest of third and fourth fuscous: pronotum and scutellum black; hemelytra light brown with clavus, inner and outer angles of corium and apex of cuneus darker; membrane pale dusky, nervures darker; legs yellow with bases of coxae black and apices of tarsi fuscous, rostrum yellow with basal segment and apex of last segment fuscous; abdomen and underside black.

Covered with fine erect or semi-erect pubescence. Macropterous.

Genitalia: aedeagus (Fig. 18 D) of orthotyline type with the apex of the vesica raised, as in all *Mecomma* species; vesical appendage with thin dorsal process and apex with a slight twist; right clasper (Figs. 18 B, C) with extremely broad ventral process which distinguishes it from *M. o. orientalis;* left clasper curved and similar to the type subspecies.

Other specimens: unfortunately all the antennal segments except the basal were missing from the other specimens, in one of these the basal segment was yellow and in the other brown. Otherwise similar to type; for measurements see Table 1.

Female: unknown.

Specimens studied: 1 ♂ (Holotype), Kurseong, E. Himalayas (5,000 ft.), 7/7/08 (Brit. Mus.); 2 ♂ Gangtok, Sikkim, (6,000 ft.), 29/4/28, F. M. Bailey.

Distribution of M. orientalis himalayensis: Eastern Himalayas (Sikkim and N. Bengal).

Notes on M. orientalis: this species is sharply distinguished from *M. amicus* by the form of the vesical appendage of the male genitalia, in *M. orientalis* the apex of this structure is single, resembling *Cyrtorhinus* in this respect. *M. orientalis* differs form *M. amicus* in coloration and proportions, and can, with experience, be distinguished with the naked eye by the slightly narrower and less convex form of the anterior pronotum, the anterior collar being well marked. The two subspecies *orientalis* and *himalayensis* are clearly distinguished by the form of the right genital clasper and by the slightly different proportions, especially the wider head and short cuneus of *himalayensis*. The two subspecies whose habitats are montaine grassland associated with damp, but temperate woodlands, are separated from one another by the Deccan plateau and the Ganges valley.

Forms a and b of *M. o. orientalis* are distinguished in the male by the partially pale third antennal segment, the longer cuneus and antennae and wider pronotum of form a and in the same form of female by the partially dark second antennal segment and the shining hemelytra. There are no differences of any magnitude in the male genitalia and those in the female are only slight. It will be seen from Figs. 23-25 that there is some overlap between the range of variation of these species even with the most diagnostic measurements. The majority of the material available was collected by Mr. T. V. Campbell; who, it is understood, mounted his captures, generally on the same day as capture. As forms a and b (of both sexes), were often mounted on the same card, suggesting that they were collected together, it seems unlikely that they could be different seasonal forms of the same species or different ecotypes, although the latter possibility cannot be eliminated. Until further material and ecological information is available *M. o. orientalis* should be regarded as polymorphic.

MECOMMA AMICUS (DISTANT)

Antiphilus amicus Distant, Ann. Mag. Nat. Hist. (8) 4: 521, 1909; Distant, Fauna. Brit. Ind. Rhync. 5: 272, fig. 147, 1910.

Mecomma amicus Carvalho, An. Acad. Brasil. Ci. 24 (1): 78, 1952.
* *Aristobulus filius* Distant, Ann. Mag. Nat. Hist. (8) 5: 17, 1910 n. syn.) Distant, Faun. Brit. Ind. Rhync. 5: 286, fig. 157, 1910.
* *Cyrtorhinus filius* Carvalho, An. Acad. Brasil. Ci. 24 (1): 79, 1952.

(Figs. 19 A-G)

Characterized by its entirely black antennae, size and genitalia.

Male: length 4.0-4.5 mm., width 1.20-1.28 mm.; head, width 0.80 mm., vertex 0.38 mm.; antennae, segment I, length 0.45 mm., II 1.35 mm., III 1.15 mm., IV 0.43 mm.; pronotum, length 0.50 mm., width 0.95 mm.; rostrum length 1.33 mm.; cuneus length 0.72mm.

Head black, sometimes two slightly paler areas adjacent to the eyes; antennae black; pronotum and scutellum black; hemelytra light brown with clavus, inner and outer angles of corium and apex of cuneus dark brown; membrane light grey, nervures brown; legs yellow-red, apices of tarsi slightly darker; underside and whole of abdomen black.

Pubescence of fine semi-erect hairs. Macropterous.

Genitalia: aedeagus of orthotyline type, the vesical appendage with dorsal projection and apically bifid (Fig. 19 D), left clasper strongly curved (Fig. 19 E). The right clasper with the ventral process curved anteriorly (Figs. 19 B, C).

Female,brachypterous: length 2.1-2.4 mm., width 1.4 mm.; head, width 0.83 mm., vertex 0.38 mm.; antennae, I 0.36., II 0.87 mm., III 0.74 mm., IV 0.37 mm.; pronotum, length 0.41 mm., width 0.86 mm.; rostrum length 1.1 mm.

Entirely black apart from two small areas median and adjacent to the eyes which are pale yellow-green and the legs which are testaceous, with only the base of the coxa black.

Pubescence of fine pale adpressed hairs, some longer ones on the anterior of the thorax, those on the legs dark. Brachypterous, hemelytra reaching to posterior of segment six, membrane absent and cuneal suture absent.

Genitalia: K structure (Fig. 19 F) with an elongated curve process.

Macropterous: length 3.75 mm., width 1.35 mm.; head, width 0.90 mm., vertex 0.36 mm.; pronotum, length 0.53 mm., width

1.10 mm.; otherwise as in brachypterous form. Hemelytra dark brown to black, membrane dusky with nervures darker, otherwise as in brachypterous form.

Distribution: Sikkim, N. Bengal, and Manipur (Assam).

Sspecimens studied: 1 ♂ (Holotype of *amicus*) "Darjiling (6,000 ft.), 25/9/08, Brunetti (Brit. Mus.); 1 ♀ (Holotype of *filius*), "Darjiling" (6,000 ft.), 23/9/08, Brunetti (Brit. Mus.); 2 ♂ "Darjiling" (6,000 ft. — sweeping grass and low herbage), 25/9/08, Brunetti; 2 ♂ Ukhral, Manipur (6,400 ft.), Aug. 1908, Pettigrew; 1 ♂ Kurseong, E. Himalayas (5,000 ft.), 7/7/08; 23 ♀ Darjeeling (7,000 ft.) 11-20/3/24, R. W. G. Hingston; 9 ♂ 5 ♀ (2 macropt.), Gangtok, Sikkim (6,000 ft.), 24 April—2 May 1928, F. M. Bailey.

An examination of the types of *Antiphililus amicus* Distant and *Aristobulus filius* Distant for their coloration and size, in relation to other Indian specimens, shows that these are the male and female of the same species. This conclusion is supported by the similarity in the locality data. *M. amicus* is distinguished by the entirely black antennae in both sexes and the genitalia; the bifid apex of the vesical appendage and the longer basal antennal segment clearly separates it from *M. orientalis*. It is closest to *M. ambulans*, unfortunately however most work on this latter species had to be done on material from England; it is highly desirable that larger samples from other parts of its range should be compared with *M. amicus*, for even within the English material one specimen (out of several) of *M. ambulans* from Harpenden had measurements just within the range of variation of *M. amicus* (Figs. 23, 24). Measurements of several specimens of each species are given in Table I and II and the diagnostic characters plotted on Figs. 23, 25; it will be seen that *M. amicus* differs from *M. ambulans* in being smaller in both sexes. It also differs in having the antennae entirely black in the female, whilst they are partially pale in this sex of *M. ambulans* and the male genitalia of the two species, although close are distinct.

Hitherto *M. amicus* only has been recorded from Sikkim, N. Bengal and Manipur, Assam, but it probably occurs throughout the Eastern Himalayan and Assam regions between 5,000 and 7,000 ft. where the cold temperate forest occurs.

MECOMMA CHINENSIS (REUTER)

Mecomma chinensis Reuter, Annu. Mus. Zool. Acad. St. Petersb. 10: 63, 1905.

Characterized by its black coloration, the long antennae with the basal segment pale.

Male: unknown.

Female: Reuter's description: —

Femina late ovata, nigra, capite abdominequc nitidissimus hoc subaeneo-micante, pronoto, scutello hemielytrisque opaculis cum dorso abdominis longe cinereo-pubescentibus; vertice utrimque guttula minuta obsoleta testacea; rostro, articulo primo nigricante excepto, antennis articulo primo toto secundoque basi, nec non pedibus flaventibus; antennis articulo secundo margine basali pronoti (formae brachypterae) saltem dimidio longiore versus apicem in clavam elongatum incrassato, tertio secundo fere $\frac{1}{3}$ breviore, dimidio basali albo. Long ♀ 3 mm.

Ad flumen Schubagu d. 8 auguste 1893, unicum specimen.

M. ambulanti (Fall.) simillima, antennis longioribus, aliter constructis, articulo primo flavo-testaceo divergens. Caput (♀ brachypt.) basi pronoti aeque latum, valae nitens, ab antico visum latitudine verticis oculique unici aeque longum, vertice oculo circiter duplo latiore. Rostrum coxas posticas subattingens, apice nigro. Antennae (♀) corporis longitudine, articulo secundo sat longe adpressim piloso, primo fere $3\frac{1}{2}$ longiore, a medio fortuis incrassato, ultimus semierecte pilosis. Pronotum (♀ brachypt.) basi longitudini fere duplo latius apice quam basi vix magis quam $\frac{1}{-}$ augustius disco horizontali, angulisantius rotundatis, lateribus mox ante angulos posticos leviter sinuatis, margine basali late sinuato. Hemielytra tota nigra, medium abdominis paullo superantia, clavo et cuneo haud discretis, margine apicali latissime rotundato, membrana angustissima. Tibiae tenuiter concoloriter spinulosae. Tarsi articulo ultimo apice fusco.

Distribution: Schubagu, China (only known from the type locality).

Specimens of this species were not available for study, but it would appear to be closest to *ambulans* Fall. on size, differing in the antennae which are longer with the basal segment pale.

MECOMMA AMBULANS (FALLEN)

Capsus ambulans Fallen, Mon. Cimic .Suec.: 104, 1807; Herrich Schaeffer, Wanz. Ins. 3: 109, figs. 335-337, 1836; Reuter, Hem. Gymn. Eur. 3: 384, 555 ,pl. 2, figs. 1-2, 1883; Saunders, Hem. Het. Brit. Is.: 280, pl. 26, fig. 3-4, 1892; Stichel, Illus. Best. Deut. Wanz. 8: 226, figs. 588-89, 1933; Wagner, Tierw. Deut. 41, Blindw.: 129, fig. 1952.

* *Capsus dubius* Zetterstedt, Ins. Lapp.: 279, 1840 (syn. by Thomson, Opusc. Ent. 4: 437, 1871).

* *Capsus ochripes* Curtis, Brit. Ent. 15, pl. 693, 1838 (syn. by Douglas & Scott, Brit. Hem.: 349, 1865).

* *Capsus nigritulus* Zetterstedt, Ins. Lapp.: 279, 1840 (syn. by Thomson, Opusc. Ent. 4: 437, 1871).

(Fig. 22 B)

Characterized by its size, proportions, genitalia and the female with entirely black hemelytra, but partially pale antennae.

Male: length 4.4-4.6 mm., width 1.38-1.42 mm.; head, width 0.86 mm., vertex 0.36 mm.; antennae, segment I, length 0.46 mm., II 1.50 mm., III -.38 mm., IV 0.52 mm.; pronotum length 0.50 mm., width 1.07 mm.; rostrum length 1.30 mm.; cuneus length 0.90 mm.

Head black with two pale areas adjacent to the eyes; antennae entirely dark; pronotum and scutellum black; hemelytra light ochrous brown with the clavus, apices of corium and cuneus, and inner angle of corium suffused with black, and the remaining margins of the cuneus and outer margin of the corium a deeper yellow-brown; membrane pale, nervures margined with black; legs yellow-brown, the apex of the tarsi darker and base of coxa black; rostrum yellow-brown, its tip darker; sides and venter of thorax black; abdomen entirely black.

Pubescence of fine semi-erect hairs of medium length (0.15 mm.) their alveoli being well marked on the hemelytra. Macropterous.

Genitalia: aedeagus (Fig. 21 F) of orthotyline type with bifid tooth vesical appendage, left clasper strongly curved (Figs. 20 C, D), right clasper (Fig. 21 E) with an apical toothed ridge and a thin median projection. Singht-Pruthis (1925) figure of the aedeagus of this species is quite incorrect.

Female: *Brachypterous*: length 2.4-3.0 mm., width 1.58-1.70 mm.; antennae, I 0.48 mm., II 1.25 mm., III 1.12 mm., IV 0.53 mm.; pronotum, length 0.5 mm., width 0.98 mm.; rostrum length 1.30 mm.

Head black, two slightly paler areas adjacent to the eyes, antennae, first and second segments black, the third pale for basal third of its lengts, the remainder of the third and the fourth segment brown; pronotum, scutellum and hemelytra black; legs light yellow-brown with bases and apices of tarsi darker; rostrum yellow-brown, its apex dark; entire underside black, extreme margins of connexivum brown.

Pubescence of semi-erect hairs of medium length (0.13 mm.), they are particularly dense on the second antennal segment and paler and sparser on the third and fourth. Brachypterous, hemelytra reaching posterior of third abdominal segment; membrane and cuneal sutures lost.

Genitalia: the K structure (Fig. 20 I) is tapered and curved.

Macropterous: length 4. 25 mm.; width 1.50 mm.; pronotum, length 5.60 mm., width 1.20 mm.

Otherwise measurements, colouration and pubescence as in brachypterous female, with membrane dusky, the nervures black-grey outlined with black.

Distribution: Europe, Caucasus, Algeria, N. Asia, Alaska and Canada.

Specimens studied: 1 ♀ New Forest, Hants., U. K. 24/8/47 T. R. E. Southwood; 1 ♀ E. Peckham, Kent, U. K., 16/8/48, T. R. E. Southwood; 5 ♂ 2 ♀ Harpenden, Herts., U. K. 14-25/8/53, T. R. E. Southwood; 5 ♂ 6 ♀ (1 macrop.) S. Lake District, U. K., J. E. Satchell & T. R. E. Southwood 17-30/7/54; 1 ♀ Moffat, Scotland, U. K. Fryer col.; 3 ♂, 3 ♀ Cambridgeshire, U. K. Fryer col.; 1 ♂, 1 ♀ Bradore Bay, Quebec.

The almost entirely black female, the black antennae, its size and genitalia distinguish this species from *amicus* Distant the closest Old World species and from *gilvipes* Stal and *luctuosus* Provancher in the New World. Knight says that all records of ambulans for Anerica are incorrect and that males of this species and *gilvipes* can be separated only by the structure of the genitalia.

This assertion was corrected later in a paper by Walley (Can. Ent. 64: 152, 1932) in which a series of 37 males and 21 females from Bradore Bay were found by Knight to be *ambulans* (Fallen) after comparison with European specimens. A male and female of this species were studied by the senior author at the California Academy of Sciences.

The egg of this species, described by Kullenberg (1913) is laid in the stems of various *Juncus* spp. and grasses (Kullenberg, 1946) (Fig. 22) during late summer (July and August) and hatch the following spring, mostly in May. The nymphs, which are greenish-red, mature from late June onwards (Butler, 1923, Southwood unpublished).

MECOMMA MADAGASCARIENSIS REUTER 1892

Mecomma madagascariensis Reuter, Ent. mon. Mag. 28: 185, 1892; Poppius, Acta Soc. Sci. Fenn. 44 (3): 75, 1914.

Male: Reuter's description: —

Elongatus, niger, nitidus, longius pallido-pubescens; gutta utrinque verticis rostro pedibusque flavo-ochraceis; hemielytris dividis, clavo commissura apiceque late, corio intravenam cubitalem, angulo anteriore, cunei membranaque cum venis brachiali et cubitali nigricantibus, corio extra venam cubitalem, cuneo, angulo interno excepto, areola membranae minore cum vena connectante limboque laterali externo pallidis, angulis apicalibus corii exteriore et cunei concoloribus. Long. $4\frac{2}{5}$ mm.

Specimens of this species were not available for study.

MECOMMA GRANDIS nov. sp.

Characterized by its size, entirely black antennae and partially pale hemelytra.

(Fig. 20 A)

Male: unknown.

Female: length 3.25 mm., width 1.68 mm.; head, width 1.00 mm., vertex 0.48 mm.; antennae, segment I, length 0.45 mm.; II 1.19 mm., III 1.04 mm., IV 0.48 mm.; pronotum length 0.55 mm., width 1.05 mm.; rostrum length 1.50 mm.; hemelytra width 0.87 mm.

Head black, with two slightly paler areas on the vertex adjacent to the eyes antennae entirely black; pronotum and scutellum black; hemelytra black with a lateral and apical band of about $\frac{1}{3}$ their width yellow-testaceous; legs testaceous with extreme bases of coxae and apices of tarsi darker; abdomen black with margins of connexivum redish; underside black; rostrum yellow-testaceous with basal and apical segments fuscous.

Covered with pale short adpressed hairs and longer fine erect hairs; hemelytra and pronotum strongly rugose; brachypterous, but trace of membrane remaining.

Distribution: Djem-Djem Forest, 45 miles west of Abbdis Ababa, Ethiopia.

Specimens studied: 1 ♀ (Holotype), Edge of Djem-Djem Forest (c. 9,000 ft.), Abyssinia, 4/10/26, H. Scott (Brit. Mus.).

This species is distinguished from *M. ambulans* and *M. amicus* by its partially yellow coloured hemelytra, resembling in this respect *M. luctuosus* and *M. gilvipes*, and from these species and *M. melanocephalus* by its large size.

The only known specimen of this bug was collected by Dr. Hugh Scott at the edge of the Djem-Djem (or Jem-Jem) Forest in October. D. Scott has kindly given us the following information about the area: the forest itself is coniferous with giant Junipers, 60 ft. or more in height and giant *Podocarpus*. The forest is reeking wet during the Great Rains which end in September or later, and probably remains damp for most of the year; the general climate is cool temperate. From his Journal Dr. Scott finds that on October 4th, 1926, he collected much material from the grassland and isolated clumps of trees at the edge of the forest. An account of this area is given by Scott (1950).

Thus the habitat of *M. grandis* agrees closely with that of other members of the genus, viz. damp grasslands in or around the margins of cold temperate forests.

MECOMMA ANTENNATA (VAN DUZEE)

Mecomma antennata Van Duzee, Proc. Cal. Acad. Sci. 7: 275 ,1917.

Characterized by its colour and genitalia.

Male: length 4.5 mm., width 1.3 mm.; head, length 0.2 mm., width 0.8 mm., vertex 0.35 mm.; antennae, segment I, length 0.3 mm., II 1.5 mm., III 1.4 mm., IV 0.3 mm.; pronotum, length 0.5 mm., width at base 1.0 mm.; rostrum, length 1.4 mm.

Colour dark brown to castaneous (antennae, head, pronotum and scutellum); two last antennal segments darker (base of third segment slightly paler); two faint spots on vertex near eyes, hemelytra (except infuscate area of clavus and corium along commissure), legs and rostrum pale yellow translucent to ochraceous; apex of cuneus and membrane infumate, the first and veins darker; underside of body castaneous.

Cuneus twice as long as wide at base, vertex with a row of bristles.

Genitalia: aedeagus with a spiculum (Fig. 21 H) less curved apicallq as in *gilvipes*. Left clasper very similar to that of *gilvipes*. Right clasper (Fig. 21 B) characteristic, as seen in figure.

Female: length 2. 7 mm., second antennal segment 1.1 mm., third segment 0.9 mm.; pronotum, length 0.5 mm., width at base 0.9 mm.

Similar in colour to male but brachypterous, without cuneus, membrane and claval suture, the second antennal segment moderately incrassate calli of pronotum not noticeably prominent.

Fig. 11

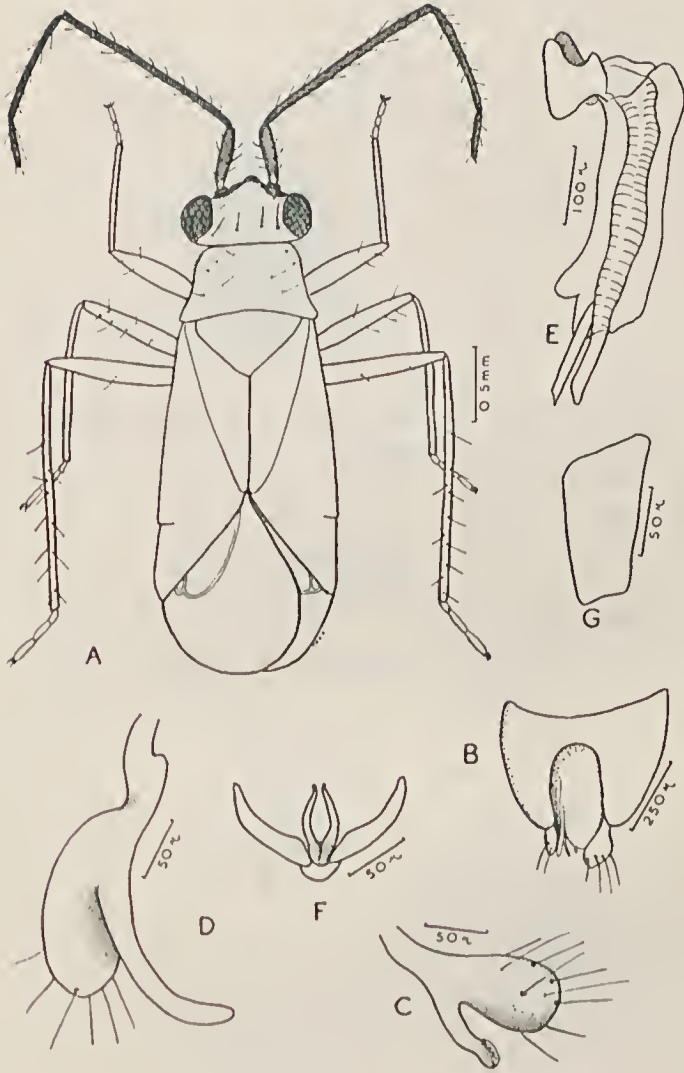



Fig. 12

A — Cyrtorhinus fulvus, anterior portion of body or male.

B — Idem, spiculum of aedeagus.

C — Idem, right clasper.

D — Idem, left clasper.

E — Idem, K structure of bursa copulatrix.

G — Idem, lateral view of pygophore.

H — Idem, right clasper.

F — Cirtorhinus lividipennis, spiculum of aedeagus.

Fig. 12

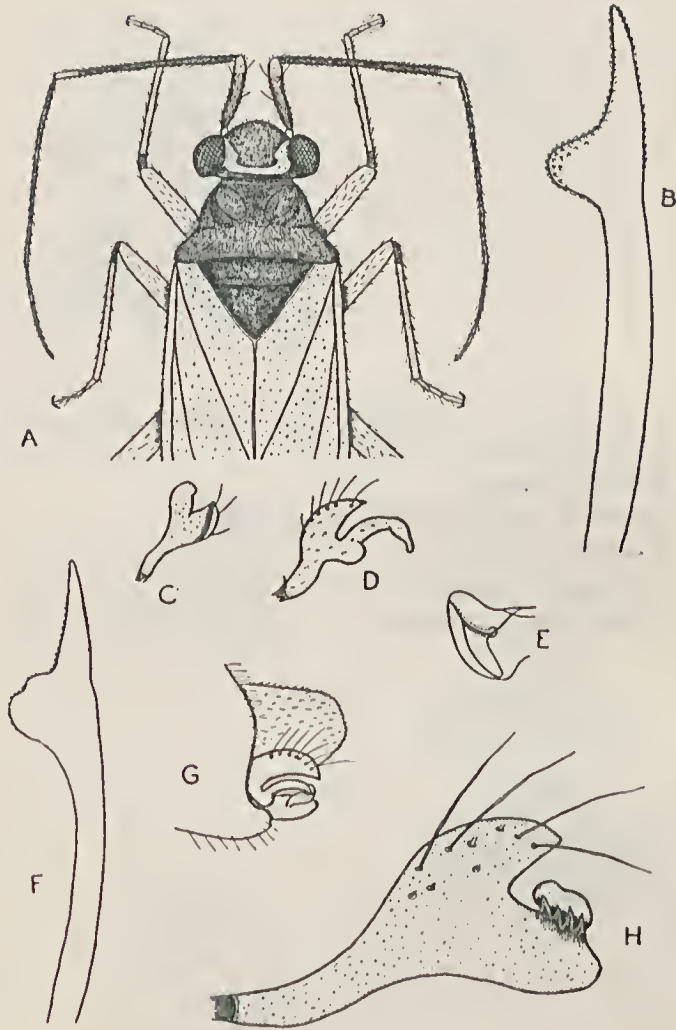



Fig. 13

A — *Cyrtorhinus lividipennis*, head and pronotum, specimen from India.

B — Idem, specimen from Fiji.

C — Idem, aedeagus.

D — Idem, K structure of bursa copulatrix.

E — Idem, pygophore.

F — Idem, left clasper.

G, H — Idem, right clasper.

Fig. 13

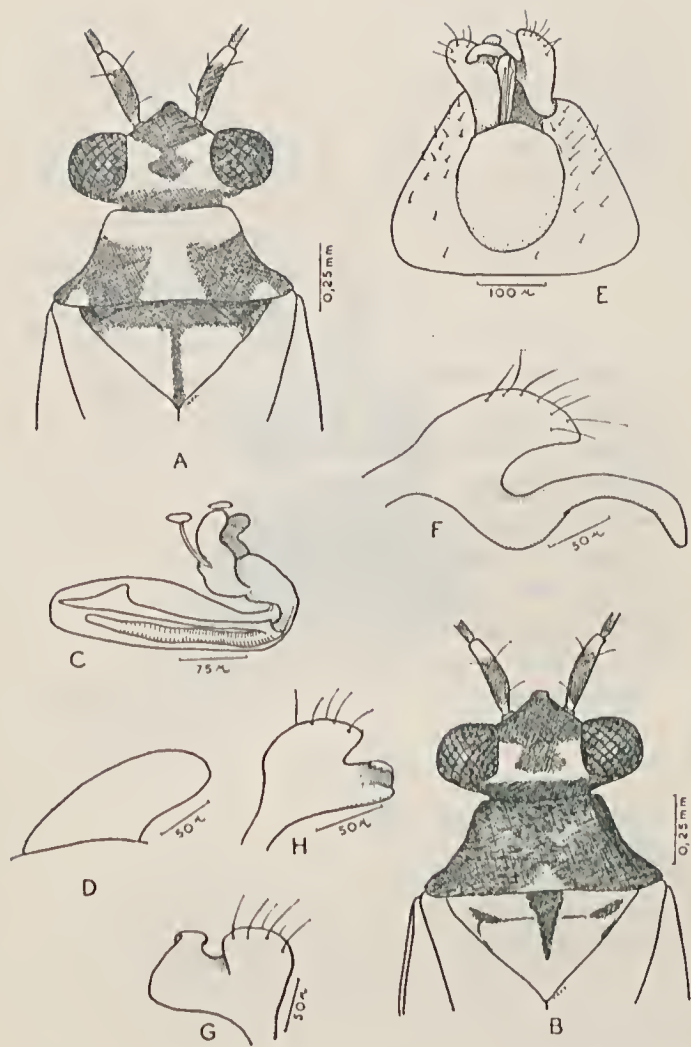



Fig. 14

A — Cyrtorhinus melanops, head and pronotum of male.

B — Idem, pretarsus.

C — Idem, K structure of burso copulatrix.

D — Idem, pygophore, dorsal view.

E — Idem, pygophore, lateral view.

F — Idem, left clasper, ventral view.

G — left, clasper, internal lateral view.

H — Idem, right clasper, dorsal view.

I — Idem, right clasper, internal lateral view.

J — Idem, aedeagus.

Fig. 14

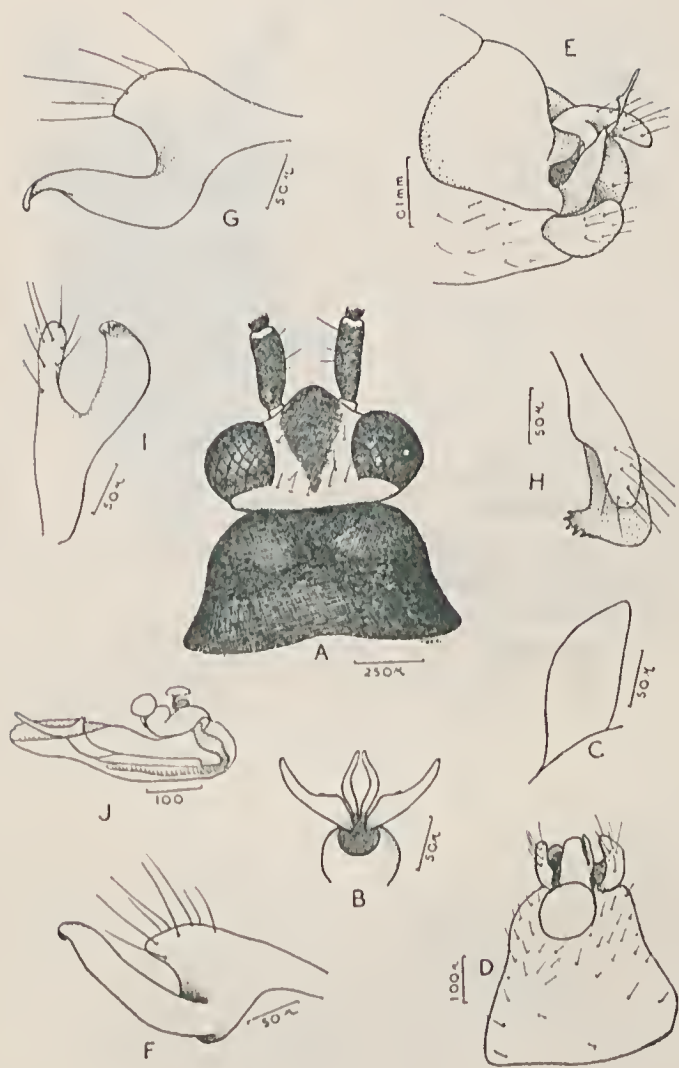



Fig. 15

A — *Cyrtorhinus caricis*, head and pronotum of female.

B — Idem, pygophore.

C — Idem, pretarsus.

D, E — Idem, left clasper, internal and dorsal views.

F — Idem, right clasper.

G — Idem, K structure of bursa copulatrix.

H — Idem, aedeagus.

Fig. 15

Fig. 16

A — Cuneus of *C. caricis*.

B — Idem, *M. ambulans*.

C — Idem, *F. flaveolus*.

D — Lateral view of prothorax of *C. caricis*.

E — Idem, *M. ambulans* male.

F — Idem, *M. ambulans* female.

G — Idem, *F. flaveolus*.

H — Hemelytra of *M. ambulans* showing six different degress of development from brachypterism to macropterism (after Stichel, 1952).

Fig. 16

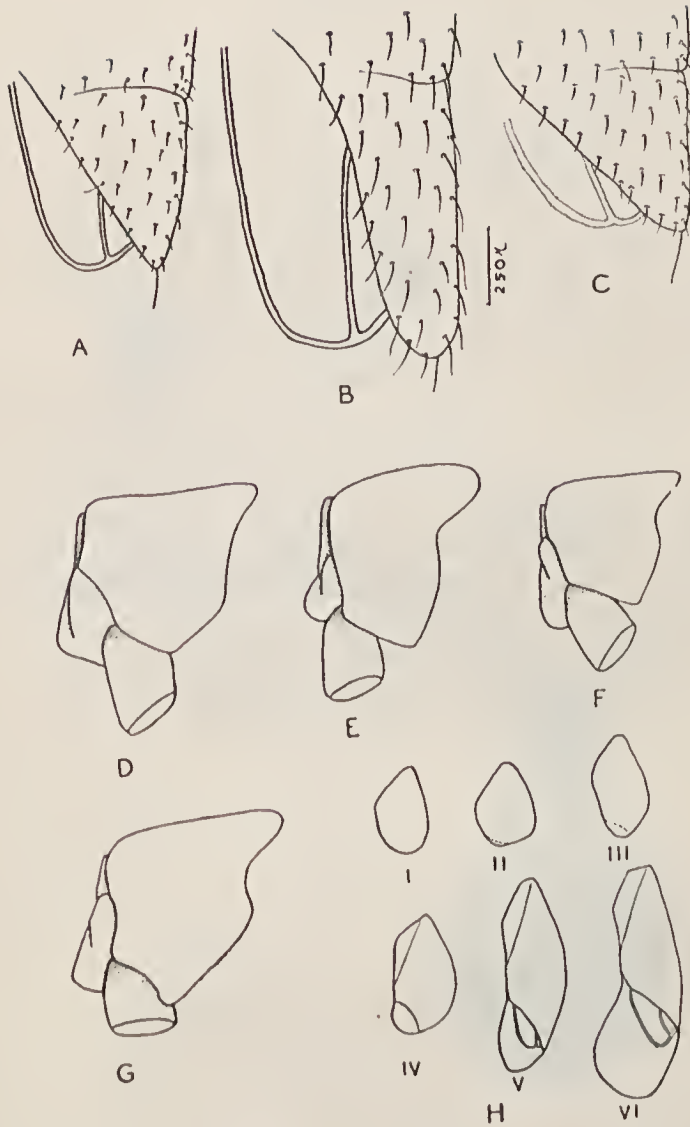



Fig. 17

A — *Mecomma orientalis orientalis* male, form a, holotype.
B — Idem, female.
C, E — Idem, right clasper, dorsal and ventral views.
D, I — Idem, left clasper, internal lateral and dorso lateral views.
F — Idem, vesical appendage.
G — Idem, K structure of bursa copulatrix, form a.
H — Idem, K structure of bursa copulatrix, form b.

Fig. 17

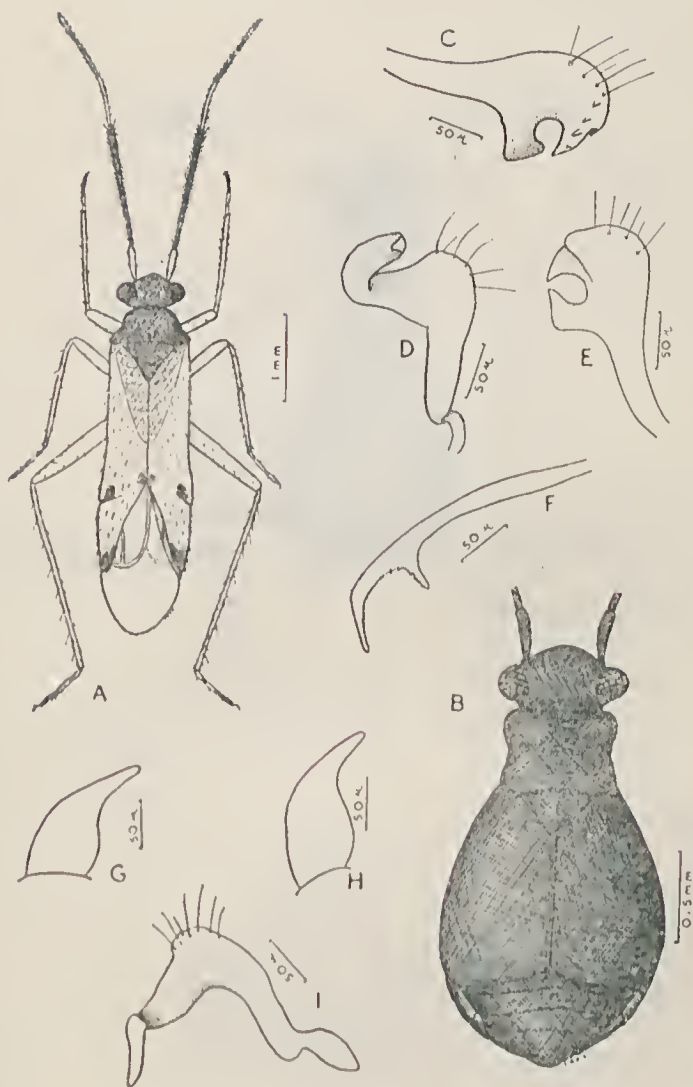



Fig. 18

A — *Mecomma mimetica* n. sp., female, holotype.

B, C — *Mecomma orientali himalayensis* n. subsp., right clasper dorsal and ventral views.

D — Idem, aedeagus.

Fig. 18

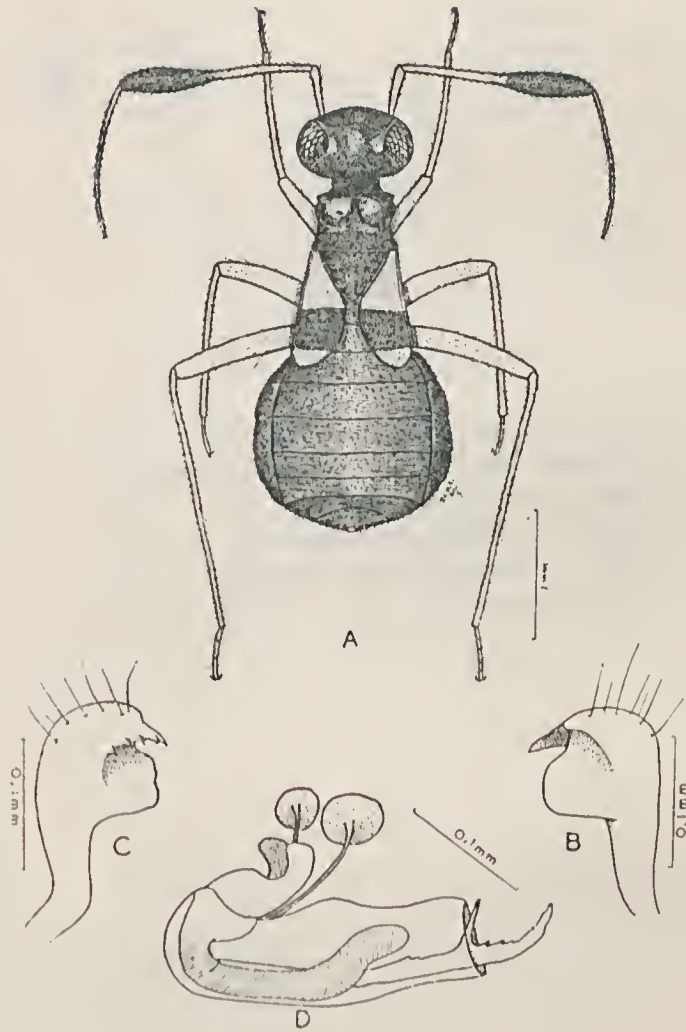



Fig. 19

A — *Mecomma amicus*, macropterous female.

B, C — Idem, right clasper, dorsal and ventral views.

D — Idem, apex of vesical appendage.

E — Idem, left clasper, dorso lateral view.

F — Idem, K structure of bursa copulatrix.

G — Idem, pretarsus.

Fig. 19

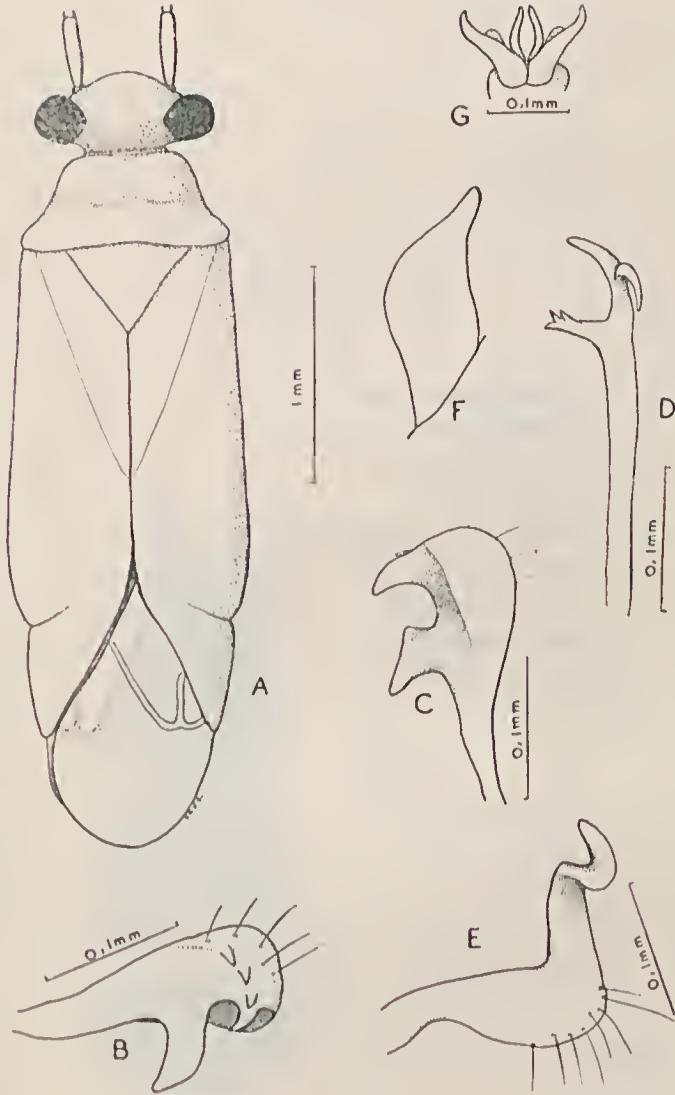



Fig. 20

A — Mecomma grandis, female.

B, E — left clasper: B — M. gilvipes.

C, D — M. ambulans.

E — M. luctuosa.

F, J — K structure of bursa copulatrix.

F — M gilvipes.

G — M. luctuosa pacifica.

H — M. luctuosa luctuosa.

I — M. ambulans.

J — M. antennata.

Fig. 20

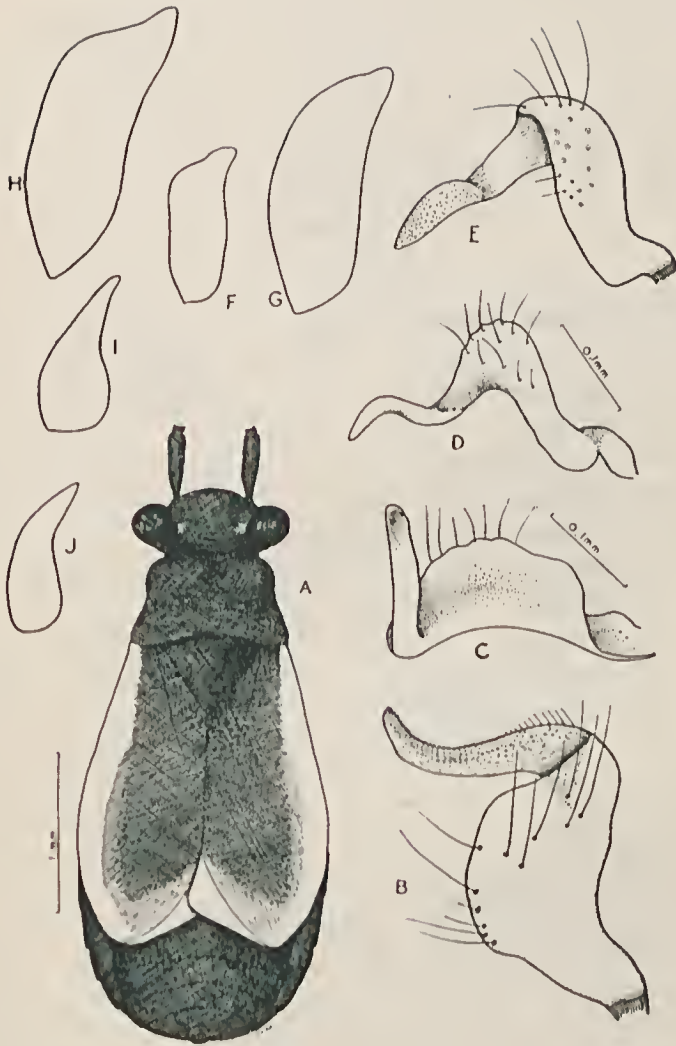



Fig. 21

Fig. 21 A, E — Right clasper of Mecomma

A — luctuosa pacifica.

B — antennata.

C — gilvipes.

D — luctuosa luctuosa.

E — ambulans.

F, J — Spiculi of aedeagus of Mecomma.

F — ambulans.

G — gilvipes.

H — antennata.

I — luctuosa pacifica.

J — luctuosa luctuosa.

Fig. 21

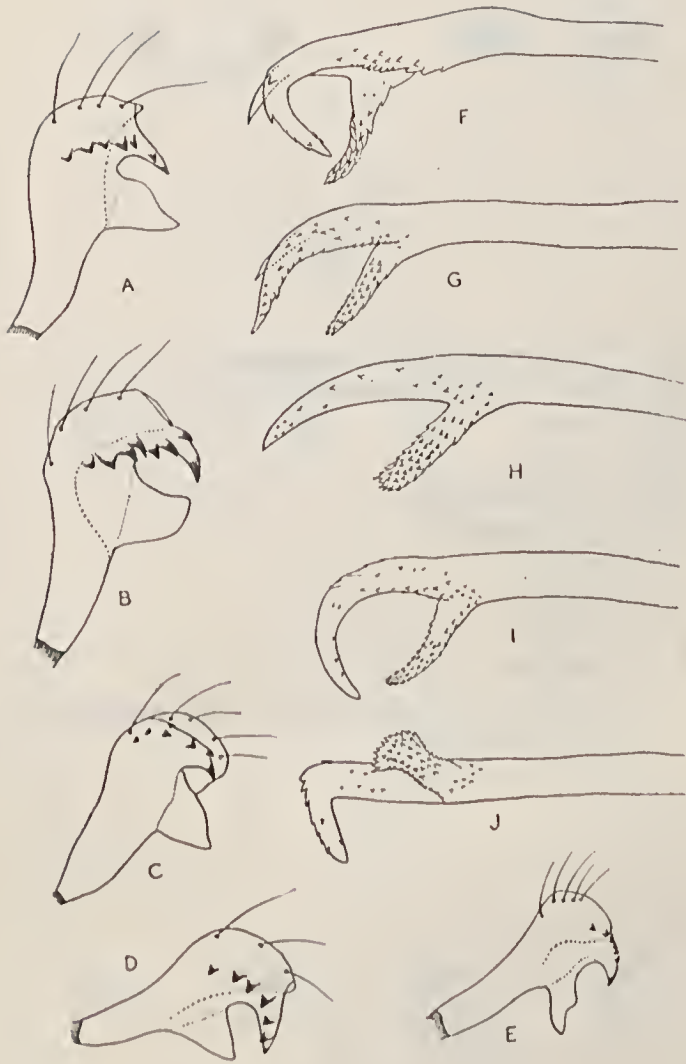



Fig. 22

Fig. 22 A — Mecomma amicus, brachypterous female.

B — Mecomma ambulans, brachypterous female.

C, E — Cuneus.

C — M. amicus.

D — M. orientalis form b.

E — M. orientalis form a.

F, I — Eggs.

F — T. mundulus.

G — C. caricis.

H — M. ambulans.

I — M. orientalis form b (ovarian egg) (f after Williams, 1931; G, H after Kullenberg, 1942).

Fig. 22

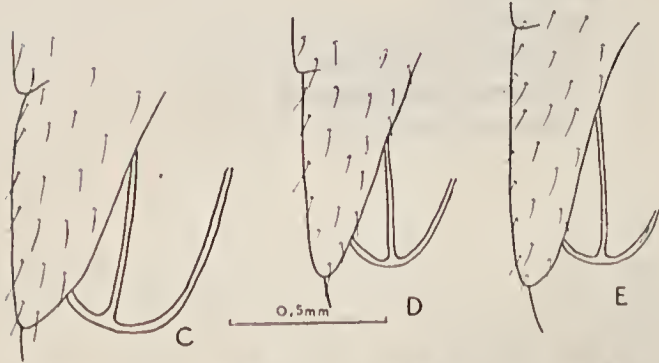
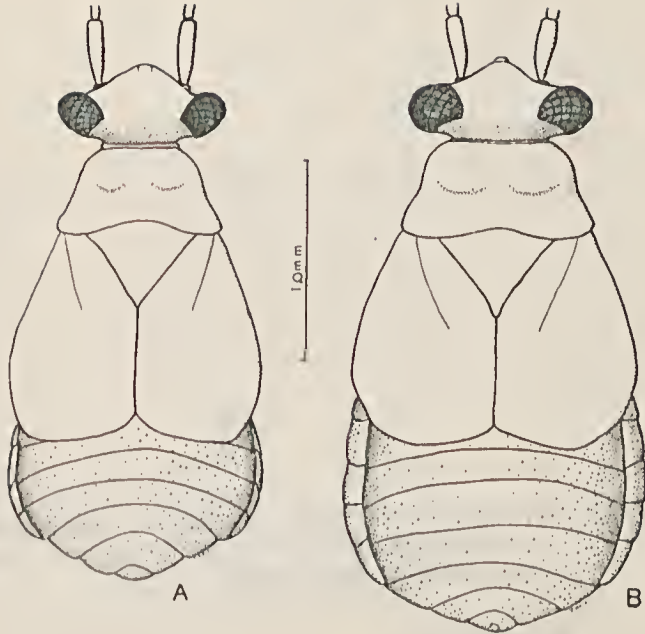



Fig. 23

Fig. 23-25 — Mecomma, scatter diagrams of diagnostic measurements: Fig. 23 — males; Fig. 24 — males; Fig. 25 — females. All measurements in mm., based on tabels I and II.

- ● ambulans
- ■ amicus
- ○ orientalis orientalis form a
- × orientalis orientalis form b
- □ orientalis himalayensis

Fig. 23

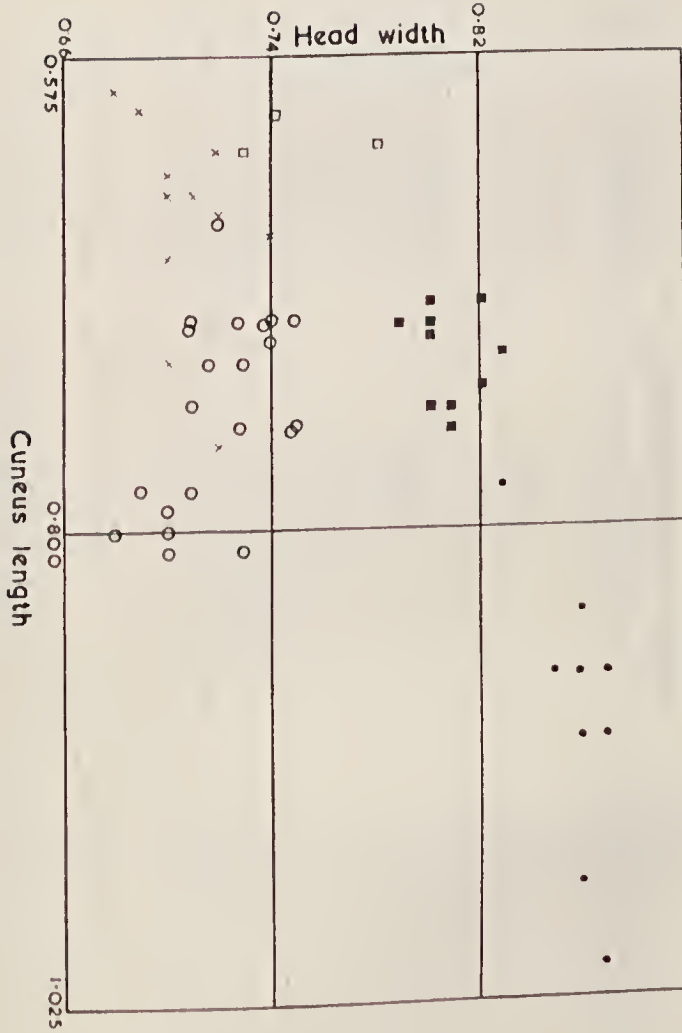



Fig. 24

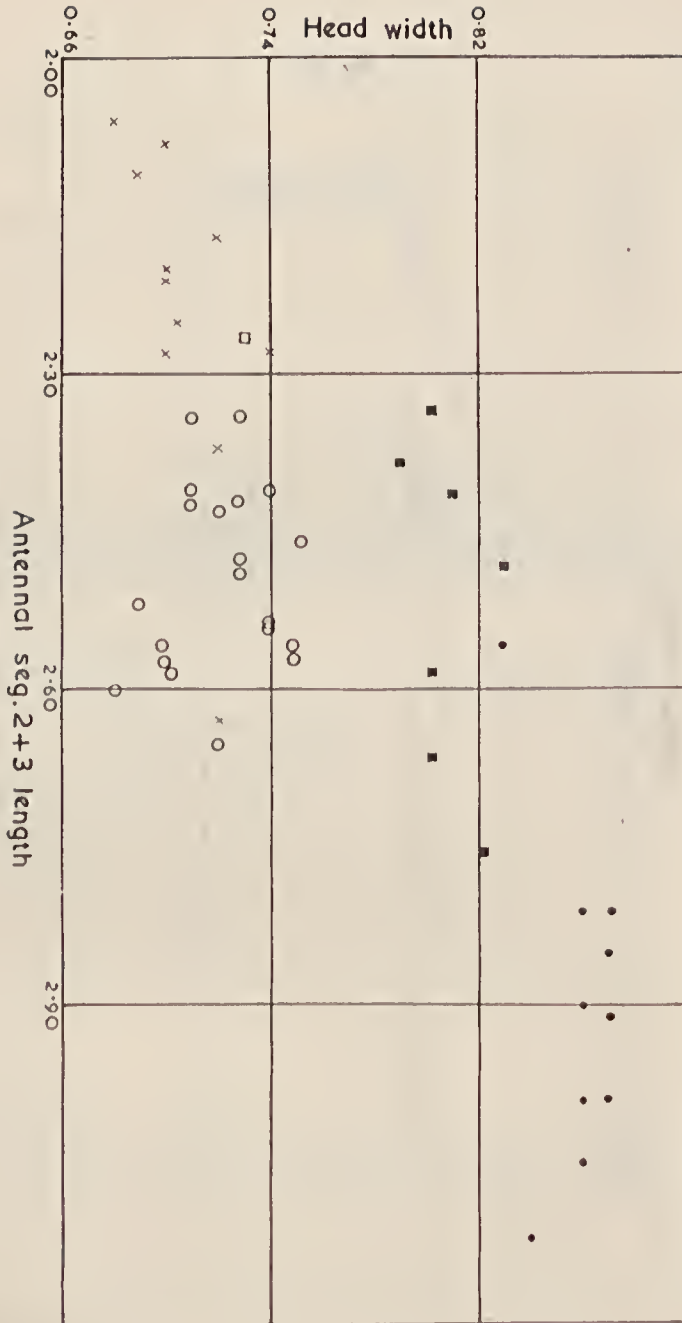
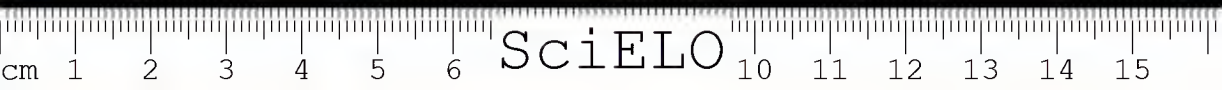



Fig. 25

Genitalia: K structure (Fig. 21 H) slightly curved, tapering to apex.

Distribution: California, U.S.A.

Specimens studied: 5 ♂ 3 ♀ Muir Woods, Marin, California, 15/7/17, F. Muir and W. M. Giffard, 4 ♂ 5 ♀ San Francisco, California, 24/7/17, W. M. Gifford.

Differs from *M. gilvipes* in the colour of body which is noticeably brown tending to castaneous, with a dark brown first antennal segment and in the structure of the right clasper and spiculum of aedeagus.

MECOMMA MIMETICA n. sp.

(Fig. 18 A)

Characterized by its colour, strongly convex calli, very short elytra and noticeably clavate second antennal segment.

Female: length 3.2 mm., width 1.5 mm.; head, length 0.5 mm., width 0.8 mm., vertex 0.37 mm.; antennae, segment I, length 0.3 mm., II 1.4 mm., III 0.8 mm., IV 0.3 mm.; pronotum, length 0.5 mm., width at base 0.6 mm.; rostrum, length 1.1 mm.

Colour black with reddish or castaneous tinge, strongly shining; antennae (except clavate apex of second segment), two spots on vertex near eyes, rostrum and legs pale fulvous, the bases of femora, trochanters and apices of coxae pale white, hind tibiae towards base and base of coxae fuscous; elytra pale translucent with a transversal dark brown fascia; connexivum with reddish to pale areas on inner margin.

Head strongly rounded, with a short neck, pronotum slightly wider at base than long, calli very strongly raised with a wide furrow between them, second antennal segment strongly clavate on apical half, elytra very short reaching only to third abdominal segment.

Male: unknown.

Holotype: female, Aspen Grove, Nicola, British Columbia, 21/8/32, G. J. Spencer, Prof. R. L. Usinger's collection; *paratype*: female, same data as type.

This species differs from others in the genus (females) in the very short elytra, clavate second antennal segment, colour of the

elytra and legs, the shape of head and very prominente pronotal calli. It was taken together with the ichneumconidae (*Gelis* sp., *Hemitelini*, Cryptinae) which it strongly mimics.

MECOMMA MELANOCEPHALUS (POPPIUS)

Nycticapsus melanocephalus Poppius, Acta. Soc. Sci. Fenn. 44 (3): 74, 1914.

Females Poppius description (translated):

Head, pronotum, scutelum, pro—and mesosternum black; collar anteriorly, calli, a longitudinal fascia at middle of disk, apex of scutellum widely, hemelytra, mesosternum posteriorly, metasternum, underside of body, rostrum, first antennal segment and legs yellow; apex of clavus, corium internally and middle of metasternum lateraly, dark; membrane yellowish brown, strongly iridescent, extreme apex of rostrum, second antennal segment and apex of clypeus black; two last antennal segments dark-brown.

Length 2.8 mm., width 0.8 mm. Nyassa Lake.

Poppius probably studied a macropterous female of this species and until further specimens are found and studied (none were available to the authors) we prefer to include it in the genus *Mecomma* Fieber and not in *Cyrtorhinus* as previously considered by Carvalho (1952).

MECOMMA GILVIPES (STAL)

Leptomerocoris giloipes Stal. Stett. Ent. Zeit. 19: 187, 1858.
Mecomma gilvipes Reuter, Hem. Gymn. Eur. 3: 386, 555, pl. 2, fig. 6; 1883.

Chlamydatus gilvipes Reuter, Ofv. F. Vet. Soc. Forh. 21: 57, 1879.

Characterized by its colour and genitalia.

Male: length 4.7 mm., width 1.3 mm.; Head, length 0.3 mm., width 0.7 mm., vertex 0.35 mm. Antennae, segment I, length 0.4 mm., II 1.4 mm., III 1.2 mm., IV 0.5 mm.; Pronotum, length 0.4 mm., width at base 1.0 mm.; Cuneus, length 0.928 mm.

Antenna, head (except two obsolete spots near the eyes), pronotum, scutellum, black to dark brown; clavus infuscate, black along commissure, corium translucid (except on commissure); underside of body black, legs pale.

Genitalia: aedeagus with tipical spiculum (Fig. 21 G) branched apically, the larger branch provided with a fairly large prong. Left clasper (Fig. 20 B) as seen in figure, the apical portion tapering and not swollen as in other species. Right clasper (Fig. 21 C) as seen in figure.

Female: length 2.7 mm., width 1.6 mm.; head, length 0.4 mm., width 0.8 mm., vertex 0.39 mm.; antennae, segment I, length 0.3 mm., II 1.0 mm., III 0.9 mm., IV 0.3 mm.; pronotum, length 0.3 mm., width at base 1. 0 mm.

Black except the base of third antennal segment, two spots near the eyes, hemelytra, rostrum and legs which are translucent, base of coxae dark.

Genitalia: K structure (Fig. 20 F) with a hump on the external margin, the apex somewhat acute.

Distribution: Described originally from Sitka, Alaska.

Specimens studied: several males and females, Anchorage, 27/7/948; Palmer, VIII, 948; Valdez, VII, 948, Alaska, R. I. Sailer col.; 3 females, Ketchican, Falls Creek, Alaska, IX, 951, B. Malkin col.; male and female, Willow, Alaska, VII, 948, F. S. Blanton col., several males and females, Popoff Is., VII, 1899, Harriman Expedition; 1 male, Wrangel, Alaska, VIII, 1951, B. Malkin col.

This species differs from *M. luctuosa* (Provancher) in the completely black first antennal segment of females and in the typical male genitalia; from *M. ambulans* (Fallen) it differs in the translucent hemelytra of females and in the male genitalia.

With exception of Alaskan records for this species, all refernces to *gilvipes* (Stal) concern either to *luctuosa luctuosa* (Provancher) or *luctuosa pacifica* n. subsp.

MECOMMA LUCTUOSA LUCTUOSA (PROVANCHER)

Chlamydatus luctuosus Provancher, Pet. Faun. Ent. Can. 3: 137, 1887.

Mecomma gilvipes Knight, Conn. Nat. Hist. Surv. Bul. 34: 510, 1923; Blatchley, Het. E. N. Amer.: 852, fig. 176, 1926; Slater, Iowa St. Coll. Jour. Sci. 25 (1): 52, pl. 6, fig. 19, 1950.

(Fig. in Blatchley, 1926)

Male: length 4.5 mm., width 1.2 mm.; head, length 0.3 mm., width 0.7 mm., vertex 0.21 mm.; antennae, segment I, length

0.4 mm., II 1.5 mm., III 1. 3 mm., IV 0.4 mm.; pronotum, length 0.4 mm., width at base 1.0 mm.; cuneus, length 0.88 mm.

Colour black to dark brown, except spots near the eyes, rostrum, hemelytra and legs which are pale to translucent, clavus and apex of cuneus infuscate; underside of body black.

Genitalia: spiculum of aedeagus (Fig. 21 J) curved apically in almost a straight angle. Left clasper (Fig. 20 E) as seen in figure. Right clasper (Fig. 21 D) as seen in figure.

Female: length 2.7 mm., width 1.3 mm.; head, length 0.3 mm., width 0.9 mm., vertex 0.36 mm.; antennae, segment I, length 0.3 mm., II 1.1 mm., III 1.0 mm., IV 0.3 mm.; pronotum, length 0.5 mm., width at base 0.9 mm.

Black except for basal half or more of second antennal segment, first antennal segment, two spots near the eyes, hemelytra, legs and rostrum.

Genitalia: K structure (Fig. 20 H) somewhat similar to that of *M. luctuosa pacifica* n. subsp.

Specimens studied: 7 males and 5 females, Machias, Me. Janson col.; 2 males and 2 females, Glen House, N. H., Parshley col.; 3 males and 1 female, Mt. Washington, Parshley col.; 2 males and 1 female, East Port Me., Parshley col:; 1 male and 1 female, Fulton Co., N. Y., Parshley col.; 1 male, Lake Placid, N. Y., Parshley col.; several males and females, Montmor Canada, Uhler col.; Indian Lake, N. Y., H. G. Barber col.; 2 males, Illinois (Brooklin Museum); several males and females, Smith River, California, Aldrich col.; females, Liberty Co., Florida, V, 924, T. H. Hubbel col.

The species was originally described from Cap Rouge, Canada.

The series from Smith River, California here referred to this species could not be separated from the typical *luctuosa* (Provancher). It may actually have a continuous distribution across the northern United States of America. All records for *gilvipes* (Stal) known up to date from the eastern United States and Canada should be referred to typical *luctuosa*.

This subspecies differs from *luctuosa pacifica* n. subsp. in the black first antennal segment of the males, in the much longer cuneus and in the shape of the spiculum of the aedeagus. The species can

be readily separated from the others in the genus by the pale first antennal segment of females and in the structure of the male genitalia.

MECOMMA LUCTUOSA PACIFICA n. subsp.

Characterized by its colour and length of cuneus on males.

Male: length 4.0 mm., width 1.3 mm.; head, length 0.2 mm., width 0.7 mm., vertex 0.34 mm.; antennae, segment I, length 0.4 mm., II 1.5 mm., III 1.3 mm.; IV 0.3 mm.: pronotum, length 0.4 mm., width at base 0.9 mm.; rostrum, length 1.3 mm.; cuneus, length 0.697 mm.

Coolur dark brown to black; first antennal segment, base of third segment, two spots near the eyes, hemelytra, rostrum and leggs; pale to dull yellowish translucent, tinged with fuscous along claval and corial commisure; veins of membrane and third segment of tarsi brown to castaneous; underside of body dark brown.

Genitalia: aedeagus (Fig. 21 I) with a spiculum broadly curved apically. Left clasper (Fig. 20 E) strongly curved and provided with a swollen apical areas covered by minute teeth. Right clasper (Fig. 21 A) as seen in figure.

Female: similar to male in colour, brachypterous, the elytra as in *antennata*. Length 2. 7 mm., width 1. 3 mm.; head, length 0.3 mm., width 0.9 mm., vertex 0.36 mm.; antennae, segment I, length 0.3 mm., II 1.1 mm., III 1.0 mm., IV 0.3 mm.; pronotum, length 0.4 mm., width at base 0.8 mm.; rostrum, length 1.3 mm.

Genitalia: K structure (Fig. 20 G) broad basally, tapering to apex, only slightly curved.

Holotype: male, Buckley, Washington, VII, 935, Oman col. in the collection of the USNM; *allotype*: female, same data as type; *paratypes*: 22 males and females, Wrangel, Beauclerc, Ducan Canal, Alaska, VIII, 1951, B. Malkin col.; 6 males and 5 females, Forks, Clallan Co., Washington, VII, 1920, E. P. Van Duzee col.: 1 female, Sasnich Dist. B. C., VIII, 1918, W. Downes col.

This species differs from *luctuosa luctuosa* (Provancher) in the pale first antennal segment of males, the much shorter cuneus and in the structure of male genitalia, especially in the shape of the spiculum.

TABLE I

Measurements of males of *Mecomma ambulans*, *M. amicus*, *M. orientalis* and *M. o. himalayensis* (all measurements in mm.)

SPECIES—LOCALITY	HEAD		PRONOTUM		ANTENNAE LENGTH				Cuneus length
	Width	Vertex width	Width	Length	I	II	III	IV	
Ambulans									
Kendal, Westm.	0.87	0.36	1.15	0.59	0.49	1.59	1.40	0.56	1.01
Cambridgeshire	0.86	0.36	1.03	0.52	0.47	1.52	1.53	0.51	0.97
Harpenden, Herts.	0.86	0.36	1.10	0.50	0.47	1.43	1.38	0.52	0.84
" "	0.83	0.35	1.01	0.50	0.45	1.33	1.23	0.48	0.78
" "	0.86	0.37	1.07	0.50	0.45	1.51	1.39	0.53	0.87
" "	0.87	0.37	0.98	0.46	0.47	1.43	1.38	0.52	0.86
Amicus									
Kurseong, Himalayas	0.80	0.37	1.09	0.52	0.45	1.46	1.20	0.48	0.74
Sikkim	0.79	0.37	0.99	0.50	0.46	1.28	1.10	0.39	0.70
"	0.82	0.37	0.94	0.53	0.44	—	—	—	0.69
"	0.80	0.37	0.90	0.49	0.41	1.25	1.08	0.37	0.69
"	0.83	0.38	0.94	0.51	0.45	1.32	1.15	0.40	0.72
Ukhrul, Himalayas	0.81	0.37	0.95	0.48	0.40	1.29	1.12	—	0.75
Darjeeling	0.82	0.39	0.92	0.52	0.46	1.50	1.25	0.45	0.73
"	0.80	0.36	1.08	0.51	0.43	1.39	1.20	—	0.73
Orientalis orientalis									
Form a									
S. India	0.68	0.32	0.92	0.47	0.38	1.48	1.12	0.40	0.80
"	0.70	0.35	0.95	0.50	0.38	1.46	1.10	0.40	0.79
"	0.70	0.31	0.91	0.47	0.38	1.43	1.14	0.40	0.79
"	0.69	0.33	0.92	0.48	0.39	1.42	1.10	0.41	0.78
"	0.71	0.31	0.97	0.49	0.38	1.47	1.12	0.44	0.78
Mysore	0.72	0.35	0.97	0.48	0.39	1.52	1.13	0.60	0.72
S. India	0.71	0.34	0.95	0.47	0.39	1.31	1.03	—	0.70
KodaiKanal, S. India	0.75	0.37	0.95	0.50	0.37	1.45	1.12	—	0.75
Form b									
S. India	0.72	0.32	0.85	[illegible]	0.38	1.37	1.00	0.41	0.65
"	0.71	0.31	0.82	0.50	0.34	1.27	0.98	0.45	0.64
"	0.70	0.31	0.74	0.50	0.36	1.15	0.93	0.49	0.63
KodaiKanal, S. India	0.70	0.30	0.87	0.51	0.37	1.28	0.92	—	0.72
Nilgiri Hills	0.70	0.31	0.80	0.49	0.37	1.29	0.99	0.52	0.64
Orientalis himalyensis									
Sikkim	0.74	0.32	0.88	0.50	0.37				0.60
"	0.78	0.35	0.87	0.50	0.37				0.62
Kurseong	0.73	0.33	0.88	0.48	0.39	1.29	0.98	0.40	0.62

TABLE II

Measurements of females of *Mecomma ambulans, M. amicus, M. amicus* and *M. orientalis* (all measurements in mm.)

SPECIES—LOCALITY	HEAD		PRONOTUM		ANTENNAE LENGTH				Hemelytra breadth
	Width	Vertex width	Width	Length	I	II	III	IV	
Ambulans									
Harpenden	0.88	0.42	0.96	0.48	0.40	0.10	1.10	0.50	0.73
East Peckham	0.90	0.42	0.90	0.50	0.38	1.11	1.10	0.51	0.70
Grange, Lancs.	0.88	0.40	0.89	0.47	0 37	1.15	1.12	0.51	0.75
Newby Bridge	0.90	0.41	0.92	0.48	0.39	1.20	1.12	0.54	0.75
Kendal, Westm.	0.92	0.40	0.92	0.51	0.40	1.24	1.11	0.52	0.75
Amicus									
Darjeeling	0.84	0.37	0.85	0.40	0.36	0.90	—	—	0.70
"	0.85	0.39	0.87	0.42	0.36	—	—	—	0.67
"	0.81	0.39	0.85	0.40	0.33	0.80	0.75	0.40	0.68
"	0.83	0.38	0.84	0.40	0.34	0.85	0.70	0.32	0.64
"	0.83	0.37	0.86	0.41	0.36	0.87	0.76	0.35	0.66
"	0.84	0.38	0.85	0.41	0.35	0.91	0.75	0.32	0·64
Sikkim	0,85	0.39	0.89	0.40	0.36	—	—	—	0.65
"	0.86	0.38	0.89	0.41	0.35	—	—	—	0.67
Orientalis orientais									
Form a									
Nilgiri Hills	0.70	0.31	0.72	0.43	0.30	0.87	0.74	—	0.68
" "	0.69	0.30	0.73	0.44	0.31	1.17	0.87	0.30	0.70
S. India	0.70	0.32	0.70	0.41	0.30	1.18	0.79	0.36	0.73
"	0.73	0.32	0.73	0.44	0.32	1.26	0.90	—	0.73
Form b									
S. India	0.75	0.32	0.75	0.45	0.31	0.92	0.74	0.36	0.75
"	0.74	0.32	0.74	0.44	0.32	0.96	0.75	[illegible]	0.73
"	0.75	0.33	0.75	0.45	0.30	0.87	0.76	0.34	0.75
"	0.75	0.32	0.75	0.45	0.30	0.96	0.75	—	0.73
"	0,74	0.32	0.75	0.49	0.32	1.00	0 76	—	0.74

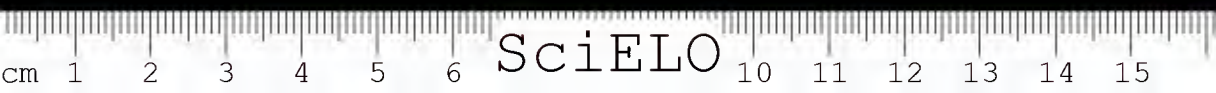
BIOLOGY

Pterygo-polymorphism

In many Heteroptera varying degrees of wing reduction are known. This phenomenon, first reviewed by Peneau (1905), has subsequently been studied by many authors; the most recent general studies are by Larsen (1950) and Poisson (1951).

All stages of wing reduction, from the fully developed to the apterous condition are rarely found in one species (e.g. *Gerris lacustris* L. — Poisson, 1951). Within the *Cyrtorhinus-Mecomma* complex (old sense) three grades can be fixed:

(a) fully developed hemelytra *macropterous* (Fig. 4 A)

(b) reduced hemelytra, membrane present *semi-brachypterous* (Fig. 8 A)

(c) reduced hemelytra, membrane absent *brachypterous* (Fig. 7 A)

A variety of intermediate conditions exist between these grades (Stehlik, 1952), but these are generally much rarer.

It is not known to what extent this reduction is environmental or genetical but in *Mecomma* it is related to sex, for the males are always fully developed and the females are generally brachypterous. Occasionally macropterous females are found and even more rarely semi-brachypterous individuals and other intermediates. The production of macropterous forms in female *M. ambulans* seems to be associated with either northern latitude or mountainous regions (Stehlik, 1952, in Czechoslovakia, Southwood, unpblished, in Gt. Britain). Such a phenomenon could be a direct environmental effect or due to a selection factor more favorable to the macropterous form in these localities. Stehlik says that in general mountain-macropterism is found in species that overwinter in the egg condition, whilst the reverse (a tendency towards brachypterism) is found in species that overwinter as adults.

The sex in wing reduction occurs and its degree are characteristic for each genus now recognised in the *Cyrtorhinus-Mecomma* complex: —

Cyrtorhinus ⟩ in female only ⟨ semi-brachypterous, in *cumberi* only

Mecomma ⟩ in female only ⟨ brachypterous condition common in all species, other conditions very rare (*M. mimetica* female micropterous)

Fieberocapsus — in both sexes, brachypterous and more rarely macropterous condition.

Tytthus — complete brachypterism is found in the male of *alboornatus*, a semi-brochypterism in the females of *pubescens* and both sexes of *geminus*.

Feeding habits

Muir (1920) found that *T. mundulus* in Queensland lived exclusively on the eggs of the sugar-cane leafhopper, *Perkinsiella sccharicida* Kirkaldy; when this mirid was introduced into Hawaii it brought about the control of the leafhopper (Swezey, 1936). Subsequent workers, notably Usinger (1939), have recorded similar habits for *T. chinensis*, *C. fulvus* and *C. lividipennis* (the details are given under each species. European authors (e.g. Kullenberg 1946, Wagner 1952) however have generally considered their species to be phytophagous. Kullenberg observed *C. caricis* feeding on various *Carex* and *Scirpus* species, but Usinger points out that even

when the bug appeared to be feeding on an unbroken plant surface there was always a Delphacid egg present, often laid from the other side of the leaf or stem. Southwood (unpublished) has noted that *C. caricis* and *T. pygmaeus* are always found together with large numbers of Delphacids, especially *Conomelus limbatus* Fab. and Massee (1954) records *T. pygmaeus* feeding on the early instar larva of a leafhopper. Kullenberg considered *Mecomma ambulans* to be phytophagous, but little is known of the biology of this genus.

Immature stages

The eggs of *T. mundulus* are laid in the leaves of the sugar cane, frequently in an old leafhopper egg slit (Williams, 1931); they are of typical mirid form and the operculum and micropylar region just projects above the leaf surface. Those of *C. caricis* and *M. ambulans* which have been described by Kullenberg (1943) are laid in the stem of various species of *Scirpus* and grasses respectively (Kullenberg, 1946) and the ovarian egg of *M. orientalis* is figured below (Fig. 22 I). The eggs of these Orthotyline species appear to be much more strongly curved than those of *T. mundulus*.

The young nymphs of *T. mundulus* are bright red in colour and also feed on leaf hopper eggs (Williams, 1931); Butler (1923) describes the first instar of *C. caricis* as orange, though later instars of this species and of *T. pygmaeus* and *F. flaveolus* resemble the adults in general coloration (Butler, Southwood unpub.).

Habitat

In temperate regions the species of *Cyrtorhinus Fieberocapsus* and *Tytthus* are found around the bases of tufts of various rushes (*Juncus*), sedges (*Carex*) and grasses growing in very damp or water logged situations. This is closely correlated with the distribution of Delphacid eggs, which as indicated above are probably their major food. In tropical regions the habitats are analagous: for example bamboo grass, young rice, sugar cane; it seems that here they are more readily taken by sweeping than in temperate areas.

Mecomma ambulans is normally found amongst damp grass, especially in or around temperate woodlands. From what is known of the distribution of *M. amicus* and *M. orientalis* together with the collector's note that latter was aken "sweeping grass", it would seem that they are confined to similar situation, which in the Indian sub-continent are only found over 5,000 ft. It is noteworthy that the solitary African specimen was taken at 9,000 ft. at the edge of the cold temperate Djem-Djem Forest, Abyssinia. The Nearctic common neartic species according Blatchley occurs upon rank herbage in moist shaded locations.

Thus it would seem that the genus *Mecomma* is always associated with damp grassy areas in temperate, mostly broadleaved, woodlands.

The males of *M. ambulans* are very active and fly readily; when alive they have a marked superficial resemblance to parasitic Hymenoptera; this probably applies to the whole genus. *M. mimetica* mimics the Ichneumonid, *Gelis* sp. and was found with it.

ZOOGEOGRAPHY

Tytthus is the most widely distributed of the four genera revised in this paper, it occurs in all the major zoogeographical regions. *T. parviceps* is particularly noteworthy with its wide distribution from Florida Central America, Venezuela and Paraguay in the west, to the Rodriguez Il. and the Seychelles in the east, whilst northwards it has been recorded from Giglio I., Italy, by Mancini (1952). As *T. parviceps* occurs on so many islands, especially isolated ones like St. Helena, it can be assumed that it has obtained this wide distribution in comparatively recent times. In the Oceania two species occur, *chinensis* and *mundulus;* on present knowledge the ranges of the species appear to be distinct, *mundulus* occuring in Melanesia and *chinensis* in Micronesia. *T. geminus* and *T. pygmaeus* have overlapping ranges in the Palearctic, whilst *T. pubescens* and *T. vagus* are probably an analogous pair of non-allied species in the Nearctic.

Cyrtorhinus is absent from the Americas but is present in both tropical and temperate regions. *C. cumberi*, in many ways the most primitive species, occurs in New Zealand; whilst *C. fulvus*, which is similar to it in many respects, is found from Java to Samoa. Overlapping with *C. fulvus*, but extending much further west into China, Burma and India is *C. lividipennis*, a species having affinities with both *C. fulvus* and the Ethiopian *C. melanops*. Set somewhat apart from the other species structurally is the Holarctic *C. caricis*. The distribution of the species of *Cyrtorhinus* and its correlation with their structural relationships shows that it is an old genus; this is further supported by the way the species are clearly separated.

In contrast to *Cyrtorhinus*, *Mecomma* is a genus of closely related species, often very similar in structure and confined to the broadleaved or mixed forest of temperate region. When present in equatorial regions, they occur only on the mountains (e.g. Nilgiri Hills, S. India) where this type of forest occurs. Of the 3 nearctic species known before, existing records show that two are restricted to the Pacific coast, *antennata* being known only from the San Francisco Bay area of California and *gilvipes* from the coastal

region and southeastern Alaska west to the treeless Aleutian Islands. The third species, *M. luctuosa* occurs from coast to coast across southern Canada and northern United States. Most of its range is occupied by the typical subspecies which is known from such widely distributed localities as northern California, Michigan and Florida. The other subspecies appears to be restricted to the coastal region from southeastern Alaska south to Washington. In India, *M. orientalis,* a distinct subspecies occurs in the *E. Himalayas,* separated from the typical subspecies by the Deccan plateau and Ganges Valley.

Fieberocapsus is represented by one species, *F. flaveolus* whose range is confined to northern Europe. Structural evidences shows that whilts *Mecomma* is very close related to *Cyrtorhinus, Fieberocapsus* belongs to another branch of the Orthotylinae.

CHECK LIST

(Sub-family Phylinae)

Tytthus Fieber 1864
- Cylloceps Uhler 1893 (nov. syn.)
- Periscopus Breddin 1896
- Breddiniessa Kirkaldy 1903 (nov. syn.)

zwaluwenburgi Usinger 1944 (nov. comb.)

chinensis Stal 1859 (nov. comb.)
- elongatus Poppius 1914 (nov. cyn.)
- annulicollis Poppius 1914 (nov. syn.)
- riveti Cheesman 1927 (nov. syn.)

parviceps (Reuter) (nov. comb.)
- pelicia Uhler

pygmaeus Zetterstedt 1840
- pellucens Boheman 1852
- insignis Douglas & Scott 1866

vagus Knight 1923 (nov. comb.)

neotropicalis Carvalho 1954
- costae Carvalho 1945 nec Stal

mundulus Breddin 1896 (nov. comb.)

panamensis n. sp.

alboornatus Knight 1931 (nov. comb.)

montanus n. sp.

geminus Flor 1860
- pubescens (Knight) (nov. syn.)

balli Knight 1931 (nov. comb.)

insperatus Knight 1925 (nov. comb.)

(Sub-family Orthotylinae)

Fieberocapsus nov. gen.
flaveolus Reuter 1870 (nov. comb.)
Cyrtorhinus Fieber 1858
Cyrtorrhinus Reuter 1884 (emendation)
Reuteriessa Usinger 1951 (nov. syn.)
cumberi Woordward 1950
fulvus Knight 1935
lividipennis Reuter 1884
vitiensis Usinger 1951 (nov. syn.)
melanops Reuter 1905
megalops Poppius 1914 error pro melanops
caricis Fallen 1807
elegantulus Meyer-Dür 1843
chloropterus Herrick-Schaeffer 1853
Mecomma Fieber 1858
Sphyracephalus Douglas & Scott 1865
Sphyrops Douglas & Scott 1866
Antiphilus Distant 1909
Aristobulus Distant 1910 (nov. syn.)
Nycticapsus Poppius 1914 (nov. syn.)
Aristobolus Carvalho 1952 error pro Aristobulus (nov. syn.)
Orientalis nov. sp.
sub. sp. orientalis nov. sub. sp.
sub. sp. himalayensis nov. sub sp.
amicus Distant 1909
filius Distant 1910 (nov. syn.)
chinensis Reuter 1905
ambulans Fallen 1807
dubius Zetterstedt 1840
ochripes Curtis 1838
nigritulus Zetterstedt 1840
madagascariensis Reuter 1892
melanocephalus Poppius 1914
grandis nov. sp.
luctuosa luctuosa Provancher 1887
gilvipes auctt. nec Stal 1858
luctuosa pacifica n. subsp.
gilvipes Stal 1858
antennata Van Duzee 1917
mlinetica nov. sp.

Species incertae sedis

Chlamydatus collaris Matsumura 1911

SUMÁRIO

O presente trabalho é uma revisão do complexo Cyrtorhinus — Mecomma *(Hemiptera, Miridae). Êsses pequenos percevejos possuem grande importância econômica e larga distribuição geográfica. Algumas espécies são usadas no combate biológico das cigarrinhas. Segundo Zimmerman (1948), a espécie* Tytthus mundulus *foi introduzida em Hawaii em 1920, proveniente de Queensland e Fiji, para auxiliar o combate à cigarrinha de cana de açúcar. A espécie estabeleceu-se e constitue um dos marcos na história do contrôle por meios biológicos. Ela contribuiu para a economia da indústria açucareira de Hawaii com milhões de dólares — o seu valor real podendo dificilmente ser estimado.*

As espécies aqui tratadas se achavam em estado confuso taxanômicamente, existindo também dúvidas quanto à sua área geográfica.

Iniciamos o trabalho com uma introdução e um histórico dos estudos prévios sôbre espécies do grupo. A seguir, damos os caracteres usados na separação das subfamílias Orthotylinae e Phylinae. Foi incluído um índice das espécies que já foram descritas no complexo com sua posição genérica atual, bem como uma chave para separação dos gêneros nêle envolvidos. Cada gênero é tratado separadamente, as espécies descritas e ilustradas com chaves apropriadas para sua separação. As espécies novas estão descritas. Comentários sôbre a biologia e distribuição geográfica das espécies foram feitos e uma lista da bibliografia mais manuseada acha-se incluída no fim do trabalho.

SUMMARY

A revision of the species hitherto included in *Cyrtorhinus* Fieber and *Mecomma* Fieber has shown that the species with bristle-like arolia and other Phyline characters should be placed in the genus *Tytthus* Fieber within the sub-family Phylinae. The Orthotyline species are alloted to *Cyrtorhinus* and to the closely allied *Mecomma*, whilst *flaveolus* Reuter is placed in a new genus *Fieberocapsus*.

Keys are given to genera and species, which are redescribed and figured or in a few cases where material was not available for study the original descriptions are given. Three new species of *Mecomma* are described, one of them with two subspecies, one of them which is polymorphic in both sexes. A new subspecies of *M. luctuosus* Prov. is described.

Notes are given on: the comparative morphology of the genitalia of the Phylinae and the Orthotylinae; on the biology of the species, including pterygopolymorphism and their use in the biological control of leafhoppers; and on their zoogeography.

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EXPLANATION OF FIGURES:

Fig. 1

A — Lateral view of aedeagus of C. caricis, with support and part of floor of pygophore.

B — Longitudinal half of male pygophore of C. caricis (diagramatic) to show structure of aedeagal support or subgenital plate.

C — Postero-ventral view of pygophore of C. caricis, claspers removed.

D — Aedeagus with aedeagus sheath of T. pygmaeus, lateral view.

E — Anterior view of pygophore of T. pygmaeus, with claspers and aedeagus removed, showing tubular structure of aedeagal sheath.

F — Lateral view of pretarsus of C. caricis (Orthotylinae).

G — Lateral view of pretarsus of T. pygmaeus (Phylinae).

l — lateral arm of basal plate; p — promotor apodeme of the phallobase; ph — paramere (or clasper) holes; s — aedeagal sheath (= aedeagal support or subgenital plate); t — theca; v — vesica; va — vesical appendage or spiculum; bp — basal plate.

Fig. 1

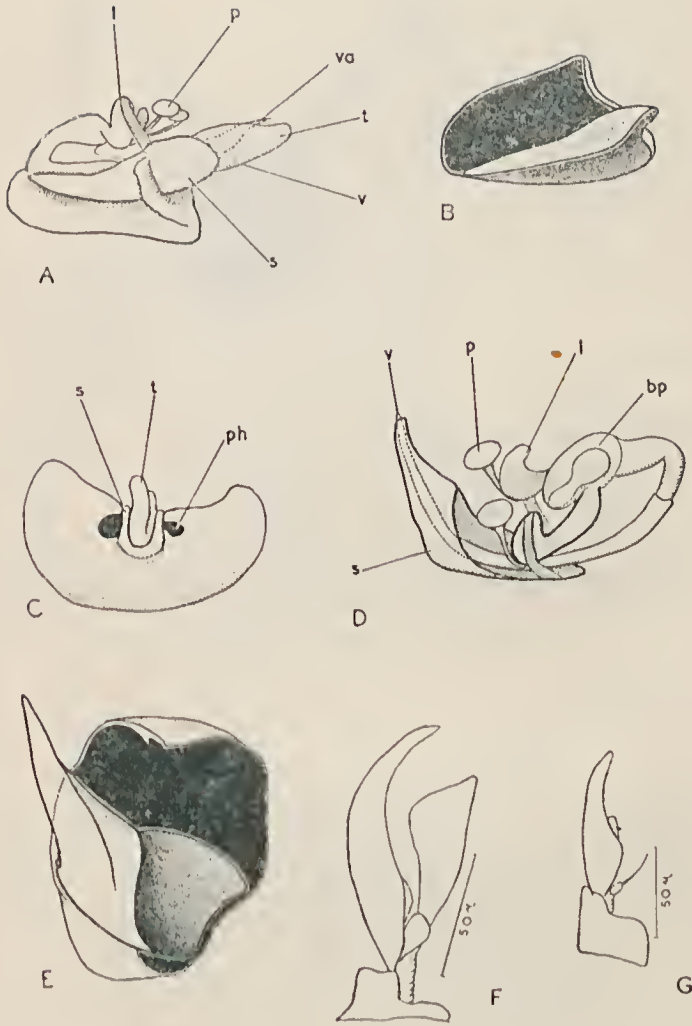



Fig. 2

A — Tytthus chinensis, male.
B — Idem, aedeagus.
C — Idem, left clasper.
D — Idem, right clasper.
E — Idem, pygophore.

Fig. 2

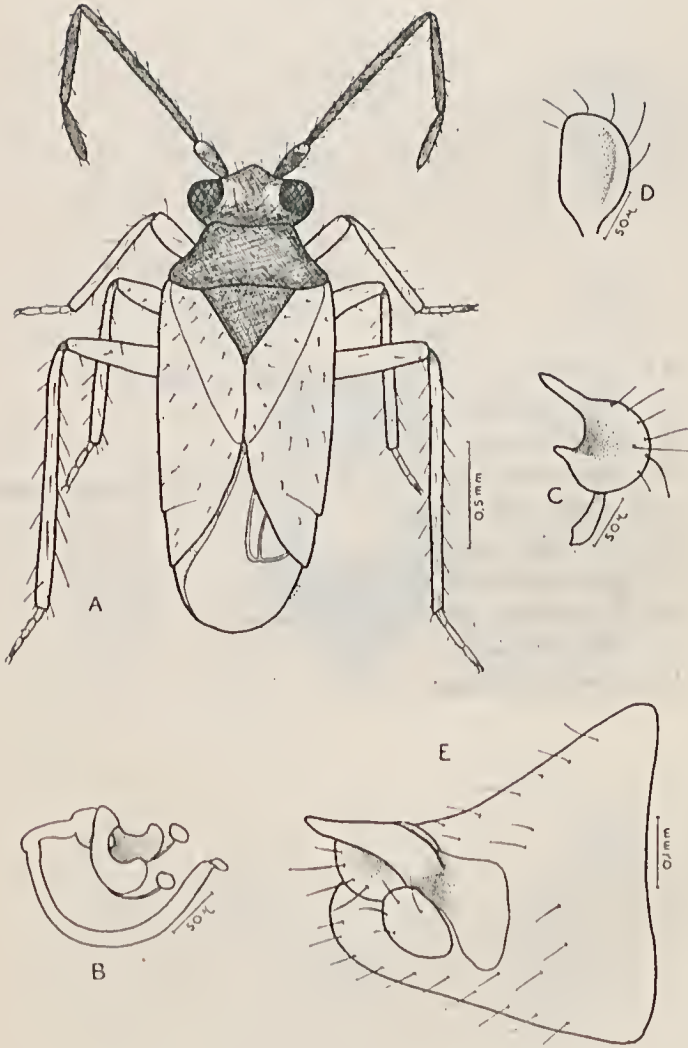



Fig. 3

A — Tytthus pygmaeus, head and thorax of male.

B — Idem, pygophore.

C — Idem, aedeagus.

D — Idem, apex of pygophore with claspers and aedeagus removed.

E, H — Idem, left clasper.

F — Idem, right clasper.

G — Idem, pretarsus.

I, J, K — Tytthus parviceps, left clasper.

L — Idem, pygophore.

M — Idem, right clasper.

Fig. 3

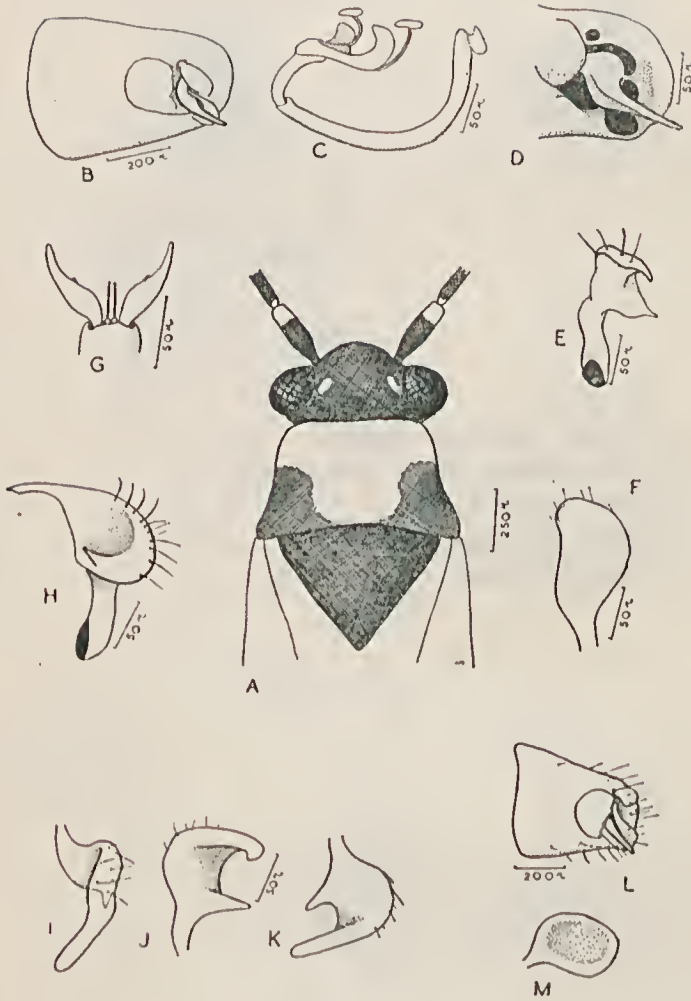



Fig. 4

A — Tytthus vagus, male paratype.

B — Idem, posterior wall of bursa copulatrix.

C — Idem, sclerotized ring.

D — Idem, right clasper.

E — Idem, left clasper.

Fig. 4

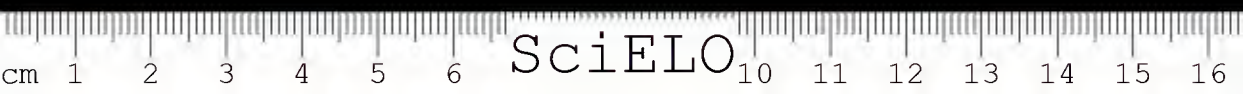
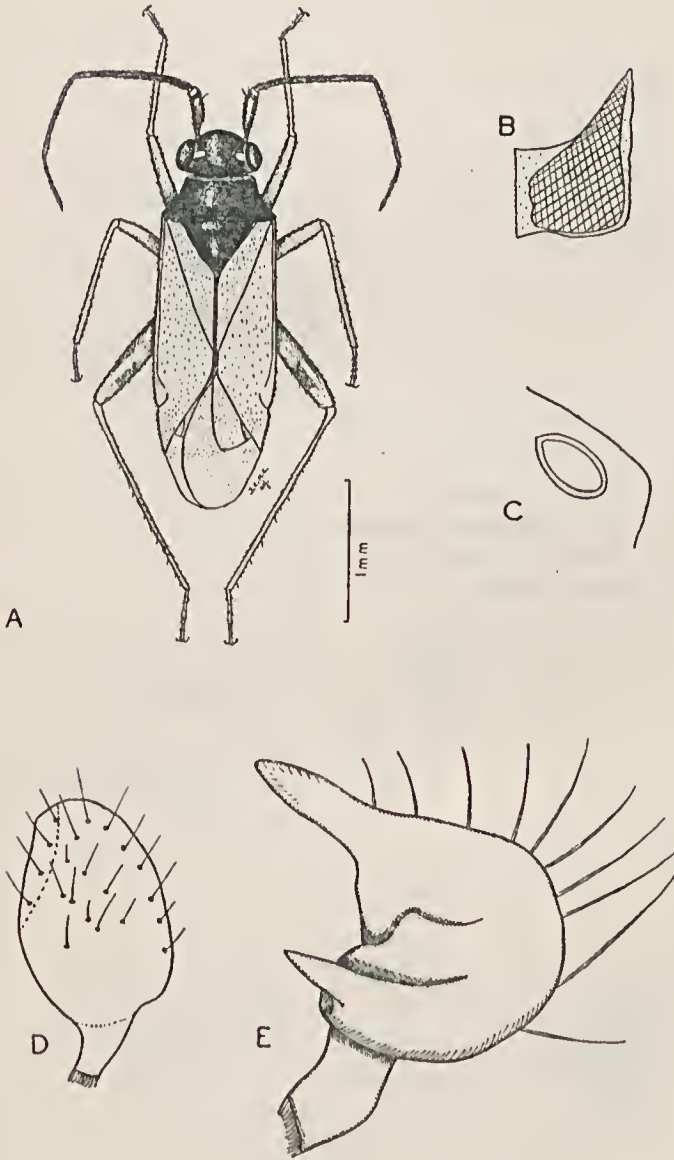



Fig. 5

A — *Tytthus balli*, male paratype.

D — Idem, left clasper.

F — Idem, right clasper.

B — *Tytthus mundulus*, pygophore.

C.—.Idem, left clasper.

E — Idem, aedeagus.

G — Idem, right clasper.

Fig. 5

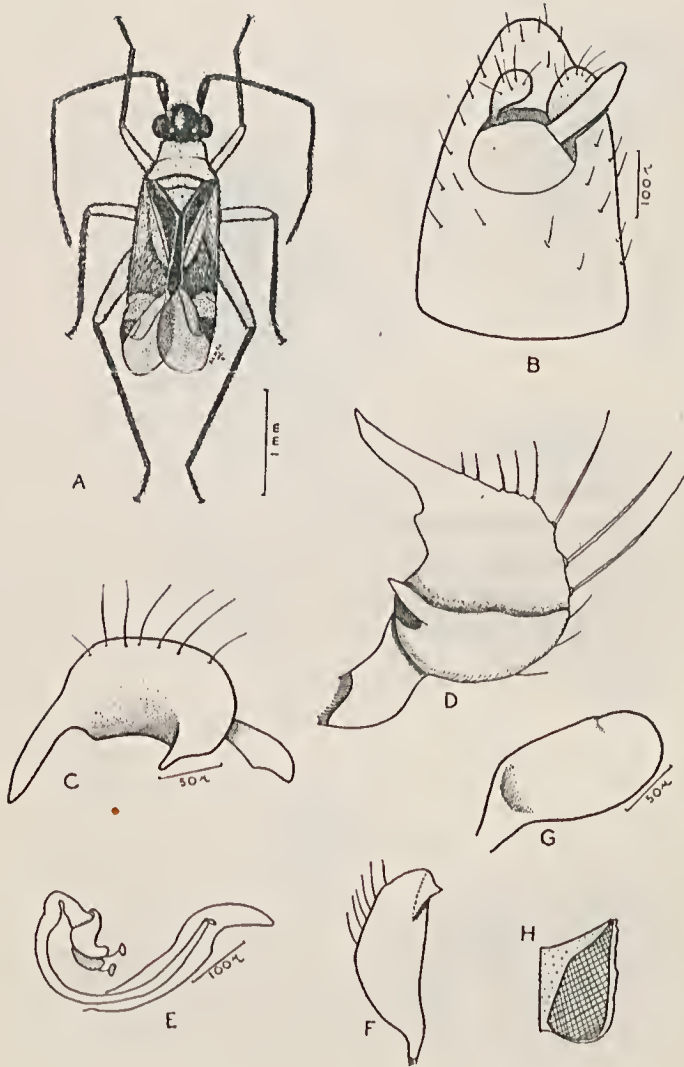



Fig. 6

A — Tytthus alboornatus, male holotype.

B — Idem, pygophore.

C — Idem, claw.

D — Idem, pygophore lateral view.

E — Idem, aedeagal sheath.

F — Idem, aedeagus.

G, H — Idem, left clasper.

Fig. 6

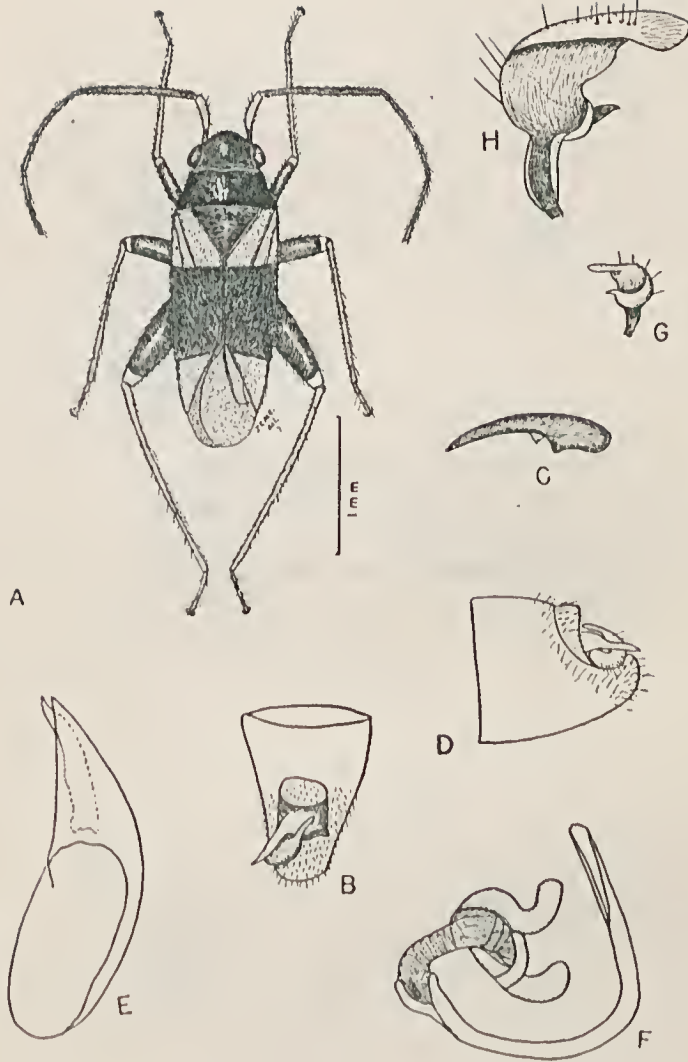



Fig. 7

A — Tytthus alboornatus, brachypterous male.

B, D — Tytthus montanus n. sp., right clasper.

C, F — Idem, left clasper.

E — Tytthus panamensis n. sp., right clasper.

G — Idem, left clasper.

Fig. 7

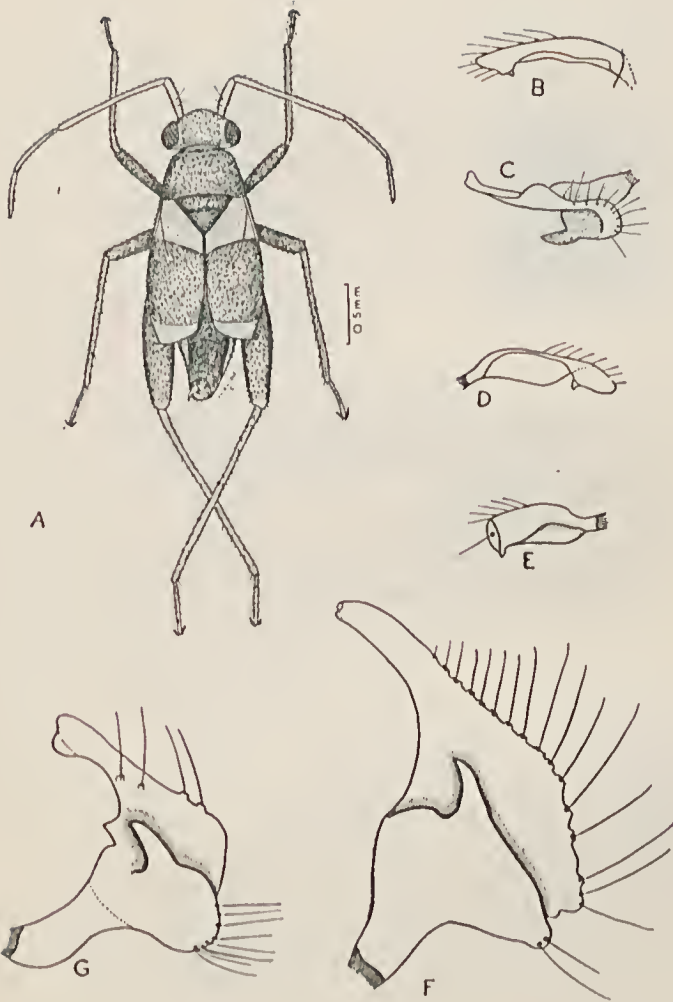



Fig. 8

A — Tytthus pubescens (Knight), female holotype.

B — Tytthus geminus, head and pronotum of male.

C — Idem, aedeagus.

D, F — Idem, left clasper.

E — Idem, right clasper.

G — Idem, pygophore dorsal view.

Fig. 8

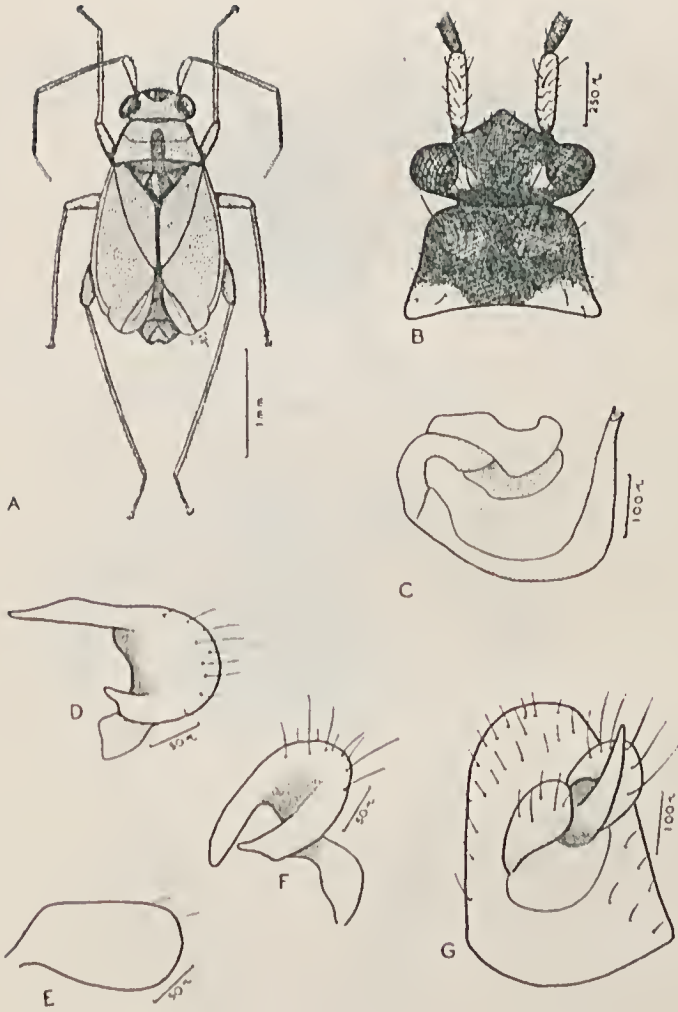



Fig. 9

— Tytthus insperatus, female paratype.

Fig. 9

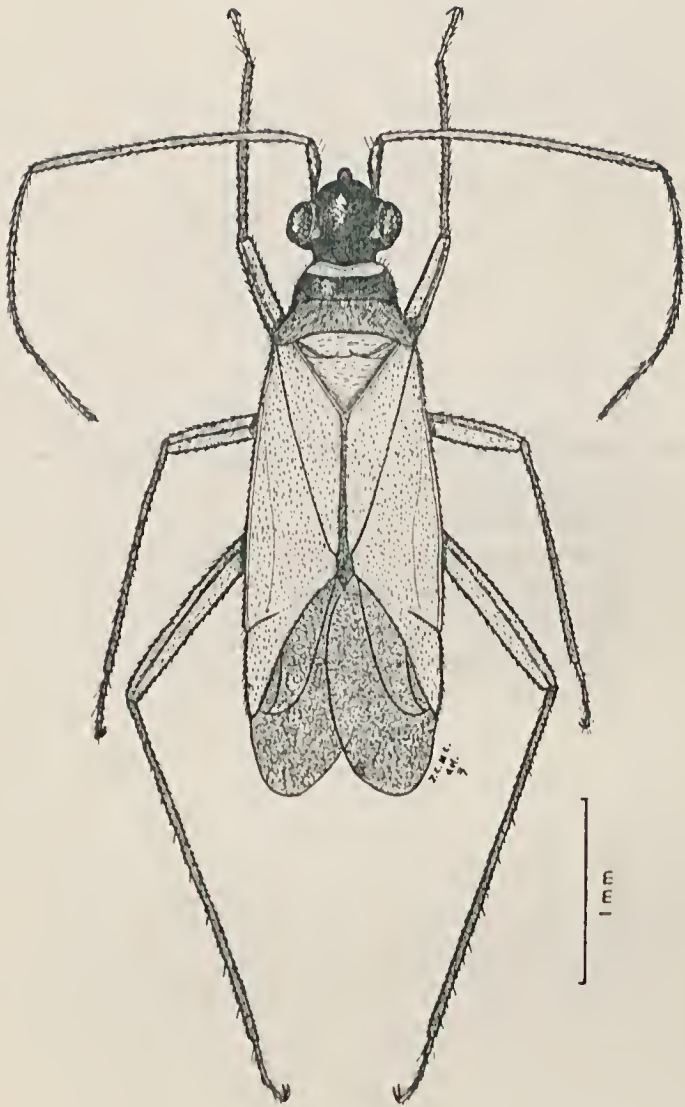



Fig. 10

A — Fieberocapsus flaveolus, right clasper, internal lateral view.

B — Idem, aedeagus.

C — Idem, pretarsus.

D, E — Idem, left clasper.

F — K structure of bursa copulatrix.

G — Idem, brachypterous female.

H — Idem, dorsal view of pygophore.

Fig. 10

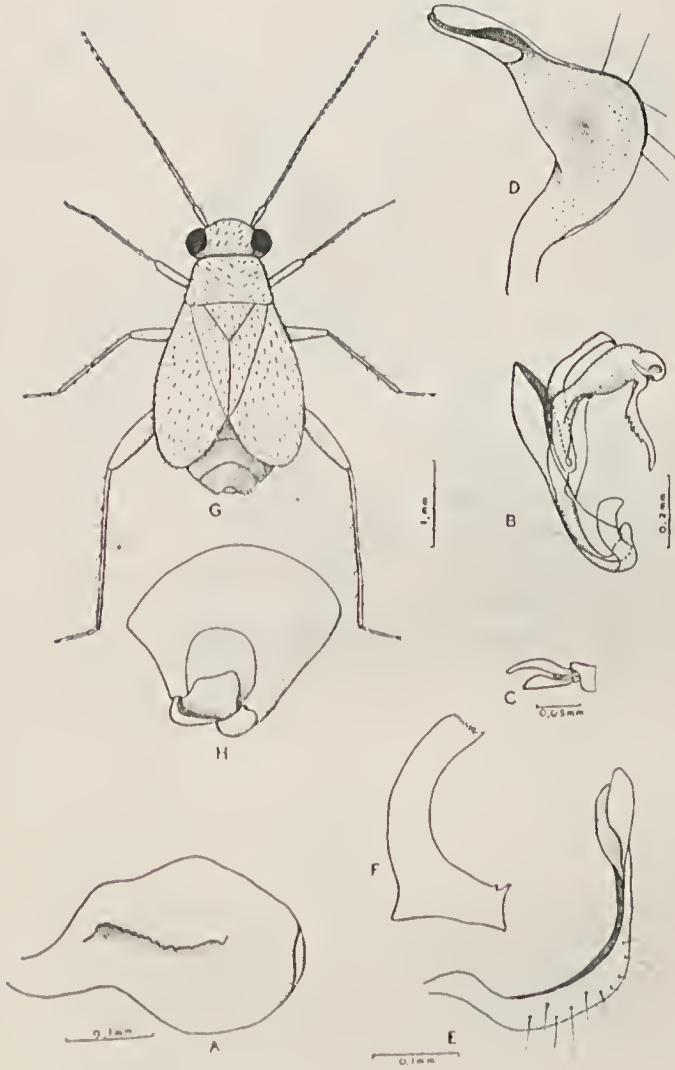



Fig. 11

A — Cyrtorhinus cumberi, male.

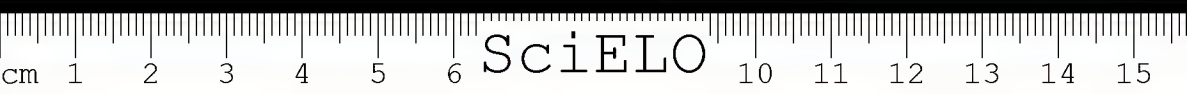
B — Idem, pygophore.

C — Idem, rigth clasper.

D — Idem, left clasper, internal lateral view.

E — Idem,aedeagus.

F — Idem, pretarsus.

G — Idem, K structure of female bursa copulatrix.

INSTITUTO NACIONAL DE PESQUISAS DA AMAZÔNIA

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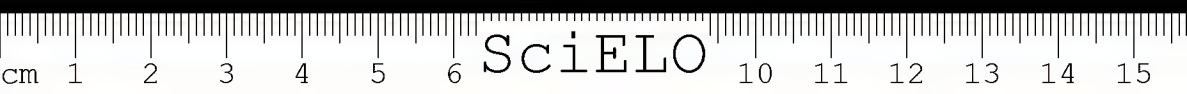
CHAVES PARA OS GÊNEROS DE MIRÍDEOS DO MUNDO (HEMIPTERA)

Por
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(Com 263 figuras no texto)

Ao iniciar seus estudos sôbre Mirídeos, o autor teve que enfrentar duas grandes dificuldades. A primeira foi a dúvida acêrca da posição sistemática verdadeira de quase 150 gêneros, a maioria dos quais não podiam ser colocados em tribos ou subfamílias devido às descrições pouco acuradas então existentes.

No catálogo genérico de Reuter (Acta Soc. Sci. Fenn. 37 (3) 1910), cêrca de 100 gêneros foram considerados como de posição incerta e vários outros foram dispostos sistemàticamente baseando-se apenas em suas descrições originais. Infelizmente, êsse mestre da taxinomia não teve a oportunidade de examinar os tipos dêsses gêneros, uma vez que se achavam espalhados pelos vários Museus da Europa e das Américas. Tal dificuldade, porém, foi removida, mais tarde, com a publicação, pelo autor do presente, do trabalho intitulado "On the Major Classification of the Miridae etc." (Ann. Acad. Brasil. Cid. 24(1):31-110, 1952) que, baseado no estudo de tipos em vários museus da Europa e América, menciona todos os gêneros grupados nas tribos e subfamílias, permitindo assim, aos entomólogos, trabalharem com êxito nesses dois primeiros degraus da sistemática, abaixo do nível de família.

A segunda dificuldade de monta era a falta de chaves apropriadas, com ilustração de caracteres críticos, para os gêneros ou mesmo grupos de gêneros, que compreendem a fauna mundial. A identificação de um determinado gênero era, geralmente, consideràvelmente retardada por exigir a consulta de um grande número de trabalhos e manuseio exaustivo da literatura. Por outro lado, o estudo baseado apenas em chaves regionais não é satisfatório desde que, em muitos casos, se torna duvidoso devido à recente introdução de espécies na região.

Êste trabalho é destinado a eliminar esta segunda dificuldade. O autor está ciente das dificuldades que seus colegas poderão en-

contrar no uso destas chaves e, por isso, deseja chamar a atenção para os seguintes pontos:

Torna-se absolutamente impossível estabelecer chaves que possam ser usadas satisfatòriamente para tôdas as espécies de todos os gêneros conhecidos até o presente, na fauna mundial. Sabemos também que a evolução pode estar agindo ativamente em muitas espécies ou gêneros, de tal forma que os extremos se completam. Chaves extremamente complexas apareceriam, se tal trabalho fôsse tentado, requerendo o estudo de todos os tipos conhecidos para milhares de espécies existentes nos museus de vários países, tornando-se, assim, o trabalho muito oneroso e exigindo tempo considerável.

As chaves aqui apresentadas são baseadas, principalmente, no estudo das espécies típicas de cada gênero e, sempre que possível, no estudo das demais espécies que compõem êsses gêneros. O dimorfismo sexual contribui também para tornar as chaves mais difíceis, sobretudo nos casos em que sòmente o macho ou a fêmea são conhecidos, e são numerosas as espécies desta categoria. As chaves foram feitas, sempre que possível, para abranger os dois sexos.

Quando surgirem dúvidas sôbre se se deve seguir êste ou aquêle ramo da chave, torna-se aconselhável, após atingir o fim do ramo em questão, rever a descrição original do gênero para uma confirmação mais satisfatória, nos casos duvidosos. Parece ao autor ser êste o meio mais eficiente e certo de verificar a exatidão do trabalho. As numerosas ilustrações incluídas no texto servirão para tornar o trabalho mais fácil e em muitos casos, elas sòzinhas indicarão a posição correta de um gênero entre outros afins.

As chaves foram elaboradas com o auxílio de um microscópio binocular, usando um aumento bastante elevado (cêrca de 70x). É muito importante o conhecimento dêste fato, uma vez que certos caracteres mencionados como forte, fundo, grosseiro etc. podem ser interpretados de outra maneira com o uso de pequeno aumento. A mesma consideração deverá ser dada à iluminação, que deverá ser forte e incidente sôbre o campo estudado. Quando estão sendo estudadas estruturas delicadas como arólios, pseudarólios, cerdas etc. devemos experimentar fundos diferentes por baixo do inseto e deve ser tentado qualquer meio ou mesmo instrumento que permita livre movimentação.

O uso de medidas é absolutamente essencial ao emprêgo das chaves. A visão apenas é muitas vêzes enganadora, sendo necessário o uso de um micrômetro ocular. As medidas são obtidas com mais êxito, quando o inseto está sôbre fundo branco. A luz é assim refletida, permitindo uma definição mais clara de margem, extremidade etc. Quando determinada parte do inseto é mencionada como mais comprida ou mais curta que outra (v.g. segundo segmento

da antena, mais comprido que a largura da cabeça), significa que uma variação até 50 micra não deve ser tomada como conclusiva. Nestas chaves, tôdas as medidas com diferença acima de 50 micra foram consideradas conclusivas. Assim, se o segundo segmento da antena é mais de 50 micra mais longo que a largura da cabeça, êle é considerado mais longo que a largura desta última (no binocular usado, cada divisão da ocular micrométrica media 15.5 micra).

O autor procurou usar o mais possível caracteres que são mais comumente preservados em exemplares de museu e que possam ser vistos externamente, sobretudo os encontrados na cabeça de pronoto. Em muitos casos, todavia, isso não foi possível e caracteres como rostro, segmentos da antena, pubescência etc. tiveram que ser considerados.

Detalhes estruturais superficiais, como pontuação, rugosidade e pubescência foram considerados com o inseto sob luz incidente. É de lamentar que em certos grupos, v.g. Phylini, a pilosidade tenha que vir a ser forçosamente considerada. São comuns os exemplares onde ela foi totalmente perdida e transtornada. Nesses casos, sòmente um especialista ou entomólogo bem treinado será capaz de colocar o gênero corretamente. Pessoas com pouca experiência devem consultar o especialista, em vez de se arriscarem a um mero palpite.

Quando se menciona pilosidade ou pêlos comuns, significa que são êles os comumente encontrados, sejam eretos ou recumbentes (deitados) porém sempre cilíndricos, direitos e afilados para a extremidade apical. Pêlos sedosos ou lanosos são os geralmente enrolados ou ondulados, deitados e brilhantes sob luz incidente. Pêlos escamiformes ou achatados são os arredondados ou em forma de escama de peixe, comumente um pouco alongados ou deprimidos, possuindo côr prateada sob luz incidente. Pêlos rijos e geralmente fortes, alongados, recebem o nome de cerdas ou pêlos setiformes.

Nestas chaves estão incluídos todos os gêneros conhecidos desde 1758 até 1954. Foram também adicionados os gêneros descritos em 1955, seja por comunicação dos autores ou por consulta de trabalhos que puderam chegar às mãos do autor.

CONTENTS

KEYS TO THE GENERA OF MIRIDAE OF THE WORLD (HEMIPTERA)

By
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(With 263 figures in the text)

When the author began his studies on the Miridae he was faced with two major difficulties. The first was the doubt concerning the correct sytematic positions of nearly 150 genera, most of which could not be placed in their proper tribes of even subfamilies because of the inaccurate descriptions then available. In Reuter's generic catalogue (Acta Soc. Sci. Fenn. 37 (3), 1910) nearly 100 genera were regarded as of uncertain position, and several others allotted positions on the basis of their descriptions only.

Unfortunately this master taxonomist was not able to examine the types of these genera, scattered as they were among the museums of Europe and America.

This major difficulty seems to be removed now with the publication by the author of the paper entitled: "On the Major Classification of the Miridae etc." (An. Acad. Brasil. Ci. 24 (1): 31-110, 1952) which based on the study of types in several museums of Europe and America, lists all genera under their correct subfamilies and tribes, thus allowing entomologists to work up satisfactorily these two first steps in the taxonomy below the family level.

The second major difficulty was the lack of appropriate keys, with illustration of critical characters, to the genera or even groups of genera which would embrace the world fauna. The identification of a certain genus was usually delayed considerably by having to consult a great number of papers, and check the literature exhaustively. On the other hand the study of regional keys only was not satisfactory since in many cases it was doubtful whether a genus had been introduced recently or not into the region.

The present paper has been written in order to remove this second difficulty. The author is aware of the difficulties which his colleagues may encounter in using the accompanying keys, and attention is called to the following points.

It seems almost impossible to establish keys to work satisfactorily for all species of all genera known at the present time throughout the world. We know that there are much gradation in nature, and that evolution may be on the march in certain species or genera so that they may merge into one another so that the extremes come in contact. A very complex key would result if such a work were attempted, and the time required to study all the types concerned in museums in many countries would be almost prohibitive.

The present keys were based mainly on the types species of the genera and, as much as possible on the study of other species included in the genera. Sexual dimorphism tends also to render the keys more difficult, especially as only the female or male sex is known for a great number of species. The keys were made whenever possible to include both sexes. When a doubt arises whether to follow this or that branch of the key, it is advised that after reaching the end of the branch concerned a check should be made with the original description of the genus in order to ascertain if one is right or not. This seems to be the safest way to do such work. The numerous illustrations annexed to the text will render the work much easier and in many cases they alone will point out a certain genus among their relatives.

The keys were constructed with the help of a binocular microscope, using a fairly high magnification (about 70 x). This is very important since certain characters mentioned as strong, deep, coarse etc., may be interpreted otherwise if low magnification is used. The same consideration applies to the illumination, which must be strong and incident over the insect. When delicate structures are to be seen, such as the arolia, pseudarolia, setae etc., different backgrounds should be tried under the insect, and any system permitting the latter to be turned around or up and down is encouraged.

Measurements are absolutely essential to deal with the keys. The eye alone is sometimes misleading and a micrometric eyepiece must be used. Measurements are better taken with a white background reflecting the light which will permit a better definition of margin or extremities. When a certain part of the insect is said to be longer or shorter than another, such as the second antennal segment longer or shorter than the head it means that a variation up to 50 microns must not be regarded as conclusive. In the present keys all measurements above 50 microns were considered as conclusive, thus if the second antennal segment is more than 50 microns as long as the width of head, it is considered longer than the head (in the binocular microscope used the micrometric eyepiece measured 15.5 microns for each division).

The author has tried as far as possible to use characters which are to be found in museum specimens and are visible externally such as those of the head pronotum. In many cases however this was not possible and characters such as rostrum, antennal segments, pubescence etc., had to be considered.

Structural details of the upper surface, such as puncturation, rugosities and the pubescence were defined with the insect under incident light. It is unfortunate that in certain groups, such as the Phylini, the pubescence must be considered, since in many cases these hairs are easily dislodged and lost. In such cases only the specialist or a well trained entomologist will be able to place the genus correctly. The inexperienced person should consult a specialist rather than risk a mere guess.

When common pubescence or hairs are mentioned it means that they are the usual ones found, either erect or recumbent (adpressed), but always cylindrical, straight, and tapering towards the apical extremity. Silky or woolly hairs are somewhat curled, usually recumbent and brilliant with incident light. Scale like or flattened hairs are flattened or rounded with typical silvery colour under incident light. Stiff and usually strong, long hairs are called bristles or setiform hairs.

So far as the author is aware these keys include all genera described until the end of 1954 and also a few described in 1955.

KEY TO THE SUBFAMILIES OF *MIRIDAE* HAHN, 1831

1. Arolia present, large and free, arising between the claws (figs. 19, 20) 2
— Arolia absent, substituted by a pair of straight hairs (figs. 2, 7, 16) 3
2. Arolia distinctly divergent toward their apices (fig. 20) usually dilated; pronotal collar always present and well separated from pronotum by a furrow (figs. 31, 38) .... *MIRINAE* Hahn, 1831 pg. 14
— Arolia parallel or convergent toward their apices (fig. 19), usually slender; pronotal collar if present, of the depressed type (figs. 32, 34, 36), not separated from pronotum by a furrow ...... *ORTHOTYLINAE* Van Duzee, 1916 pg. 15
3. Pseudarolia present, free or connected with the claw, sometimes minute and difficult to see (figs. 5-16) in this case the pronotal collar absent (fig. 33) 4
— Pseudasolia absent (figs. 1, 2, 3, 4): psonotal collar present or in case not, the claws very long, smooth and slender (figs. 1, 2) 5

4. Pseudarolia arising from the base or inner margin of claw (figs. 5-16); membrane with two cells (fig. 22); tarsi linear (fig. 29) .... *PHYLINAE* Douglas & Scott, 1865 pg. 16
— Pseudarolia arising from the ventral suurface of claw (figs. 17, 18); membrane with one cell (fig. 21); tarsi tnickened toward apices (fig. 28) *BRYCORINAE* Baerensprung, 1860, pg. 15
5. Claws toothed or tickened at base (figs. 3, 4) .... *DERAEOCORINAE* Douglas & Scott, 1860, pg. 16
— Claws smooth at base, long and slender (figs. 1, 2) .... *CYLAPINAE* Kirkaldy, 1903 pg. 17

KEY TO THE TRIBES OF *MIRINAE*

1. First segment of hind tarsi as long as or longer than second and third together (fig. 23) or when this is not the case, pronotal collar incomplete or pronotum with a lateral ridge at least anteriorly 2
— First segment of nind tarsi not as long as second and third together of if so, pronotum without a lateral ridge and pronotal collar distinct, separated from disc by a furrow (fig. 35) ... 4
2. First segment of antennae as long as head and pronotum together (fig. 44); pronotal collar distinct and complete; legs and antennae very long *MECISTOSCELINI* Reuter, 1910 pg. 102
— First segment of antennae shorter than head and pronotum together; pronotal collar if present usually incomplete; legs and antennae not noticeably long 3
3. Myrmecomophic species, usually with elytra not divided, the cuneus and membrane vestigial ar absent .... *PITHANINI* Douglas & Scott, 1865 pg. 102
— Species not myrmecomorphic, the hemielytra divided into corium, clavus and embolium, the cuneus and membrane present .... *CTENODEMINI* China, 1934 pg. 103
4. Myrmecomorphic species with the abdomen constricted at base (fig. 39); collar usually represented by a depressed line .... *HERDONIINI* Distant, 1904 pg. 109
— Species not myrmecomorphic, the abdomen not constricted at base; collar distinct, separated from pronotum by a furrow 5
5. Ostiolar peritreme small (fig. 25), its dorsal margin scarcely extending dorsal as far as ventral margin of mesepimeron; pronotal collar very wide, with mesal lenght usually as great as width of calli (fig. 47); dull black species with reddish, luteous or yellow marks ..... *RESTHENINI* Reuter, 1905 pg. 107

— Ostiolar peritremep rominent (fig. 24), its dorsal margin extending well above ventral margin of mesepimeron; pronotal collar (fig. 45) not as broad as width of calli; species if dark, usually shining 6

6. Hemielytra glassy and transparent allowing the abdomen and membranons wings to be seen from above .... *HYALOPEPLINI* Carvalho, 1952 pg. 106

— Hemielytra not glassy and transparent, the abdomen an membranous wings not seen from above *MIRINI* Hahn, 1831 pg. 82

KEY TO THE TRIBES OF *ORTHOTYLINAE*

1. Small, usually dark compact species with saltatorial femora, the genae very high (fig. 43), equal to or more than height of one eye; vertex very wide, eyes prominent; third antennal segment usually much more slender than second; body frequently with scale like pubescence; brachypterous forms very common .... *HALTICINI* Kirkaldy, 1902 pg. 65

— Species of medium size, usually greenish of light coloured, without saltatorial femora; the genae low (fig. 40) equal to or less than the height of one eye; vertex if wide then eyes not prominent; third antennal segment frequently equal to thickness of second; if body with scale like pubescence then both sexes macropterous 2

2. Myrmecomorphic species with abdomen constricted at base ... . *PILOPHORINI* Reuter, 1883 pg. 79

— Species not myrmecomrphic, the abdomen not constricted at base .... *ORTHOTYLINI* Van Duzee, 1916 pg. 68

KEY TO THE TRIBES OF *BRYOCORINAE*

1. First antennal segment incrassate, equal in lenght to half the width of vertex (fig. 27) about as long as wide; species usually of large size, with coarsely, punctate pronotum and strongly inflated scutellum, if first antennae longer than half the width of vertex and scutellum no cystiform then the membrane with auxiliary veins or head with three pointed tubercles anteriorly .... *ODONIELLINI* Reuter, 1910 pg. 40

— Firts antennal segment if not longer than half the width of vertex, then distinctly narrower than long, the pronotum smooth and shining; scutellum never inflated or cystiform 2

2. Large, long and slender species with smooth and shining body; pronotum strongly constricted anteriorly, the head with a dis-

tinct neck (fig. 30); rostrum reaching apex of anterior coxae or so; second antennal segment about three times or more as long as firts .... *MONALONIINI* Reuter, 1892 pg. 38

— Medium size to small species; pronotum usually punctured or if smooth, not constricted anteriorly or the rostrum longer, reaching beyond the apex of anterior coxae; head without a distinct neck of if present, the second antennal segment less than three times as long as first ....
.... *BRYOCORINI* Baerensprung, 1860 pg. 29

KEY OF THE TRIBES OF *PHYLINAE*

1. Pronotum without an apical collar (figs. 33-37) ....
.... *PHYLINI* Douglas & Scott, 1865 pg. 43

— Pronotum with a well marked apical collar or when this is not the case, species with ant-like appearance 2

2. Myrmecomorphic species, with abdomen constricted at base; pronotum nearly triangular or elongate, with a more or less flattened apical collar separated from disc by a slight furrow; claws usually long and slender, not bent at base; hemielytra in most cases with a white or yellow cross band or with pale areas
.... *HALLODAPINI* Van Duzee, 1916 pg. 60

— Species without myrmecomorphic appearance or if so, then abdomen not constricted at base, pronotum with a well marked collar (fig. 42); claws if long and slender noticeably bent at base; hemielytra without a wnitisn or yellow cross band or pale areas .... *DICYPHINI* Reuter, 1883 pg. 58

KEY TO THE TRIBES OF *DERAEOCORINAE*

1. Head elongate, pointed, slightly shorter than pronotum, frons horizontal or nearly so; eyes usually large; antennae very short (fig. 46); species of small size ....
.... *TERMATOPHYLINI* Reuter, 1884 pg. 22

— Head vertical or strongly declivous, much shorter than pronotum; antennae not noticeably short; species of medium or large size 2

2. Pronotum with an impressed line running from antero lateral corner to posterior margin of calli (fig. 26) ....
.... *CLIVINEMINI* Reuter, 1875 pg. 23

— Pronotum without the line mentioned above 3

3. Hemielytra hyaline, transparent and glassy, emboliar margin of corium greatly enlarged .... *HYALIODINI* Carvalho & Drake, 1943 pg. 24
— Hemielytra not hyaline, glassy or transparent 4
4. Pronotum constricted anteriorly, the calli large and fused; eyes semi-stylate; membrane with one cell .... *SATURNIOMIRINI* Carvalho, 1952 pg. 29
— Pronotum not constricted anteriorly; calli not prominente and fused, neither are the eyes semi-stylate; membrane usually with two cells .. *DERAEOCORINI* Douglas & Scott, 1865 pg. 26

KEY TO THE TRIBES OF *CYLAPINAE*

1. Head long and pointed, gula long, frons horizontal or nearly so, clipeus distinctly, curved, its apex usually ventral of its base; calli very large, confluent, occupying the anterior two thirds of pronotum (figs. 41, 51, 53) *FULVIINI* Uhler, 1886 pg. 18
— Head short and rounded, gula short, froms vertical or strongly declivous (fig. 48), clypeus in the same plane as frons; calli if large not occupying the two anterior thirds of pronotum (fig. 48) 2
2. Body strongly shining and coarsely punctate, the size of the puncture about equal thickness of first antennal segment at base; ostiolar peritreme with an ocelloid shining tubercle; membrane distinctly pilose .... *BOTHRIOMIRINI* Kinkaldy, 1906 pg. 17
— Body more finely punctate; ostiolar peritreme without an ocelloid shining tubercle; membrane glabrous or if pilose, very minutely so .... *CYLAPINI* Kirkaldy, 1903 pg. 20

KEY TO THE GENERA OF *BOTHRIOMIRINI*

1. Pronotum with tubercular shining swellings; scutellum with two lateral high lobes separated by a deep sulcus (Sumatra) .. .. *LEPROCAPSUS* Poppius, 1914
— Pronotum without tubercular swellings; scutellum not as above 2
2. Second antennal segment four times an long as the first, strongly thickened, with short hairs and two long, erect bristles; rostrum reaching the middle coxae (India) .... *DASHYMENIA* Poppius, 1910

— Second antennal segment about twice as long as the first, not noticeably thickened; rostrum reaching the anterior coxae or slightly beyond it 3

3. Scutellum with a median, apical and smooth lobe (Java) .... *DASHYMENIELLA* Poppius, 1914

— Ssutellum without a median apical lobe 4

4. First antennal segment as long as or longer than width of vertex; second segment twice as long as the first (India, Malay, Borneo, Formosa) .... *BOTHRIOMIRIS* Kirkaldy, 1902

— First antennal segment shorter than width of vertex; second segment 2-1/3 as long as the first (Prilippines) .... *BAKERIOLA* Bergroth, 1920

KEY TO THE GENERA OF *FULVIINI*

1. Pronotal collar absent or obscured by the calli 2

— Pronotal collar present 3

2. Tarsi two segmented; body shagreened, oval or rounded in outline (fig. 232) (Africa, Australia, India, Americas) .... *PERITROPIS* Uhler, 1891

— Tarsi three segmented; body not shagreened, elongate in outline (Philippines) .... *FULVIDIUS* Poppius, 1909

3. Pubescence on eyes longer than diameter of ommadium; cuneus very narrow, not as broad as the embolium or absent 4

— Pubescence on eyes absent or if present not longer than diameter of ommatidium; cuneus if present, wider than embolium 5

4. Lateral margins of pronotum strongly carinate; cuneus absent (Australia) .... *LYGAEOSCYTUS* Reuter, 1893

— Lateral margins of pronotum not carinate; cuneus present, very narrow (Africa) .... *HEMIOPHTHALMOCORIS* Poppius, 1912

5. Eyes reaching the gula below in lateral view (fig. 53) 6

— Eyes not reaching the gula below in lateral view (fig. 51) .. 13

6. Body oval; posterior angles of pronotum not produced and the lateral margins straight or convex; head and pronotum greenish metallic, punctured (New Guinea) .... *BIRONIELLA* Poppius, 1909

— Body elongate, sometimes slightly widened laterally; posterior angles of pronotum produced, the lateral margins slightly emarginate 7

7. Hemielytra without distinct cuneus and embolium, the corium divided into ecto, meso and endocorium (fig. 75) (Central & South America) .... *XENOCYLAPUS* Bergroth, 1922
— Hemielytra with a distinct cuneus and embolium 8
8. Embolium strongly widened after basal third; antennae inserted far from the anterior margin of the eyes 9
— Embolium of about the same width throughout, not noticeably widened after the basal third; antennae inserted contiguous to the eyes 10
9. Rostrum reaching the middle coxae; embolium narrowed at the apex (Ceylon) .... *LEPIDOFULVIUS* Poppius, 1913
— Rostrum reaching the base of abdomen; embolium not narrowed at the apex (Mentawei I.) .... *EUCHILOFULVIUS* Poppius, 1909
10. Rostrum reaching the middle coxae (Mexico) .... *ORASUS* Distant, 1883
— Rostrum reaching beyond the posterior coxae 11
11. First antennal segment reaching beyond apex of head (Cosmopolitan) .... *FULVIUS* Stal, 1862
— First antennal segment not reaching beyond apex of head 12
12. Rostrum very long, reaching apex of abdomen (Africa) .... *MICROFULVIUS* Poppius, 1912
— Rostrum reaching only the middle of abdomen (Colombia, Panama) .... *PERITROPOIDES* Carvalho, 1955
13. Body smooth or shagreened, not punctured 14
— Body above distinctly punctured 19
14. First segment of rostrum reaching the first coxae; antennae very long; cuneus indistinct 15
— First segment of rostrum not reaching beyond the base of head; the antennae not very long; cuneus usually distinct (at least on machopterous forms) 17
15. Antenna very long; cuneus indistinct; species of large size 16
— Antenna not very long; cuneus distinct; species of small size (BRAZIL) .... *PARAFULVIUS* Carvalho, 1954
16. Hemielytra with sparse, tubercular swellings; rostrum reaching the apex of abdomen (Malay, Philippines) .... *RHINOMIRIS* Kirkaldy, 1902
— Hemielytra without tubercular swellings; rostrum not reaching beyond middle of abdomen (Africa) .... *RHINOMIRIDIUS* Poppius, 1909

17. First antennal segment linear; first rostral segment reaching only the middle of the eyes towards the apex (Africa) .... *RHINOFULVIUS* Reuter, 1902
— First antennal segment incrassate; first rostral segment as long as the head 18
18. Species with aspect of beetle; brachypterous; calli and scutellum strongly raised (Jamaica) .... *BRACHYFULVIUS* Carvalho, 1955
— Species without aspect of beetle; macropterous; calli and scutellum not strongly raised (Australia) .... *CERATOFULVIUS* Reuter, 1902
19. Frons depressed, striolated and punctate; the body strongly punctate, cuneus absent (Java, Sumatra) .... *TERATOFULVIUS* Poppius, 1914
— Frons smooth or sulcate, without punctures 20
20. Hemielytra with tubercular swellings, vertex protruding upwards with two convex tubercles (Philippines) .... LUNDBLADIOLLA n.gen. type: *Psicolrranphus albomaculatus* Stål.
— Hemielytra without tubercular swellings; vertex not as above 21
21. Cuneus absent; first antennal segment shorter than width of head, with two or three long setae; small, compact species NEw Guinea) .... *CYLAPOFULVIUS* Poppius, 1909
— Cuneus present; first antennal segment as long as or longer than width of head, without setae; median size species ... 22
22. Body glabrous; cuneus shorter than broad at base; rostrum reaching the middle of abdomen (Borneo) .... *RHINOCYLAPUS* Poppius, 1909
— Body with sparse, yellow, adpressed pubescence on hemielytra; cuneus about as long as wide at base; rostrum reaching the apex of the abdomen or nearly so (Formosa) .... *RHINOCYLAPIDIUS* Poppius, 1915

KEY TO THE GENERA OF *CYLAPINI*

1. Body above smooth, rugose or shagreened 2
— Body above, at least on pronotum, distinctly punctured .. 12
2. Body with very short, adpressed pubescence 3
— Body with erect or semierect pubescence 7
3. Frons with a pointed process 4

— Frons without a pointed process (If frons is produced then blunt or sulcate) 5

4. Scutellum flat; clypeus compressed; anterior femora incrassate (Borneo) .... *RHINOPHRUS* Hsiao, 1944

— Scutellum with a medium tubercle; clypeus not compressed; anterior femora not incrassate (Ceylon) .... *CINNAMUS* Distant, 1909

5. Anterior tibiae strongly compressed, foliaceus (Ceylon) .... *PHYLLOCYLAPUS* Poppius, 1913

— Anterior tibiae not compressed and foliaceus 6

6. First antennal segment very short and thick, about as long as half the width of vertex; head vertical (Philippines, Palau) .... *CYLAPOMORPHA* Poppius, 1914

— First antennal segment long slender, about as long as or longer than width of vertex; head inclined (Philippines, Koror) .. .. *MYCETOCYLAPUS* Poppius, 1914

7. Frons protuding in front, deeply sulcate (fig. 244) 8

— Frons if protruding as above not sulcate 9

8. First antennal segment as long as the head, the second three times longer than the first (fig. 244) (Madagascar, Americas, New Guinea) .... *VANNIUS* Distant, 1883

— First antennal segment as long as the head and pronotum together, the second segment only 1-1/3 as long as the first (New Hebrides, Dauphin, Esp. Santo) .... *VANNIOPSIS* Poppius, 1909

9. Posterior femora noticeably enlarged towards the base; second antennal segment about 7 times as long as first segment (fig. 245) (Madagascar) .... *PARACYLAPUS* Carvalho, 1952

— Posterior femora not noticeably enlarged towards the base; second antennal segment less than 4 times as long as first segment 10

10. Body with semierect short pubescence; females brachypterous (Brazil) .... *CORCOVADOCOLA* Carvalho, 1948

— Body with long and erect pubescence; both sexes macropterous 11

11. Frons sulcate, eyes very large and shortly pedunculate; head as wide as pronotum at base; rostrum reaching hind coxae (Brazil) .... *CYLAPOIDES* Carvalho, 1952

— Frons smooth, eyes not pedunculate; head narrower than pronotum at base; rostrum longer (Philippines, New Guinea) .. .. *TRICHOFULVIUS* Poppius, 1909

12. Anterior femora strongly enlarged; cuneus absent or long as wide as base (India) .... *PROAMBLIA* Bergroth, 1910
— Anterior femora not noticeably enlarged 13
13. Eyes rising a considerable distante above dorsum of head which is very deeply sulcate (Americas) ...... *CYLAPUS* Say, 1832
— Eyes not rising a considerable distance above dorsum of head which is not deeply sulcate 14
14. Pubescence erect and very fine; rostrum reaching genital segment; embolium wide, laminate, claval, corial and embolial veins with a row of punctures (Amazonia) .... *CYLAPOCORIS* Carvalho, 1954
— Pubescence not as above or if so then embolium narrow, corial, claval and embolial veins without a row of punctures (New Caledonia) .... *FALISCUS* Distant, 1904

KEY TO THE GENERA OF *TERMATOPHYLINI*

1. First antennal segment reaching apex of head; second segment strongly enlarged, foliaceus (fig. 76) (North America) .... *HESPEROPHYLUM* Reuter & Poppius, 1912
— First antennal segmnet reaching to or beyond apex of head; second segment if incrassate, not foliaceus or flattened (fig. 71) 2
2. Hemielytra transparent; eyes distant from pronotum, with long pubescence (fig. 21) (Central & South America) .... *TERMATOPHYLIDEA* Reuter & Poppius, 1912
— Hemielytra not transparent; eyes contiguous with pronotum or nearly so, not or only shortly pubescent 3
3. Head distinctly longer than wide 4
— Head wider than long or as wide as long 5
4. Body with scale like pubescence in rows; eyes glabrous (Egypt) .... *ARGYROTELAENUS* Reuter & Poppius, 1919
— Body without scale like pubescence; eyes pubescent (North America) .... *CONOCEPHALOCORIS* Knight, 1927
5. Head almost twice as wide as long; membrane coriaceus (Central & South America) .... *TERMATOPHYLELLA* Carvalho, 1955
— Head as long as wide or nearly so; membrane not coriaceus 6
6. Pronotum with a row of punctures on sulcus behind and between calli; pubescence very long and erect; rostrum reaching apex of anterior coxae (Central America) .... *TERMATOPHYLOIDES* Carvalho, 1955

— Pronotum without the row of punctures as above; pubescence not noticeably long; rostrum reaching the middle coxae or beyond (fig. 46) (Africa, India, Malay, Borneo) .... *TERMATOPHYLUM* Reuter & Poppius, 1912

KEY TO THE GENERA OF *CLIVINEMINI*

1. Large species with several short spurious veins arising from large cell (fig. 67) (Central America) .... *MAGAMIRIS* Hsiao, 1947
— Membrane without spurious veins on membrane 2
— Anterior margin of pronotum if cystfiorm, not hooded or projecting over the head (fig. 62) 3
— Anterior margin of pronotum if cystiform, not hooded or projecting over the head (figs. 60, 63) 5
3. Body with short, adpressed pubescence; cuneus twice or more as long as wide at base (Central & South America) .... *OFELLUS* Distant, 1883
— Body with erect or semierect pubescence; cuneus less than twice as long as wide at base 4
4. Hairs of body strongly curled somewhat flattened at middle, very dense; frons pointed (Central & North America) .... *CLIVINEMA* Reuter, 1875
— Hairs normal, not curled; frons not produced (Central & South America) .... *AMBRACIUS* Stål, 1860
5. Pronotum distinctly carinate between the calli and also in the middle of collar (Central America) ... *ZOILUS* Distant, 1884
— Pronotum not carinate between the calli and the middle of collar 6
6. Lateral margins of pronotum distinctly carinate 7
— Lateral margins of pronotum not carinate 8
7. Second antennal segment stout and clavate (North America) .... *LARGIDEA* Van Duzee, 1912
— Second antennal segment linear (Panama) .... *ADMETUS* Distant, 1883
8. Body smooth, shining and glabrous (Jamaica) .... *LAMPROSCYTUS* Reuter, 1907
— Body pilose, pronotum distinctly punctate 9
9. Membrane distinctly pilose (Europe, Asia & North America) .... *BOTHYNOTUS* Fieber, 1864
— Membrane glabrous 10

10. Second antennal segment three times longer than first; body punctate only on pronotum, the rest smooth and shining (figs. 60, 63) (Central & South America) .... *GUANABAREA* Carvalho, 1948
— Second antennal segment approximately five times as long as first; body rugosely punctate (West Indies) .... *HEMICEROCORIS* Lethierry, 1881

KEY OF THE GENERA OF *HYALIODINI*

1. Scutellum with a median stout, suberect spine-like projection (fig. 25) (South America) .... *KNIGHTONIA* Carvalho & Drake, 1944
— Scutellum smooth, without a spine-like projection 2
2. First and second antennal segments very wide, laminate or foliaceus (fig. 58) (Central & South America) .... *AUCHUS* Distant, 1893
— First and second antennal segments cylindrical; if incrassate, never foliaceus 3
3. Pronotum strongly constricted on apical half, (figs. 56, 61) this portion being much narrower and as long as or longer than the head; embolium slightly wider than length of first antennal segment 4
— Pronotum not as above or of constricted anteriorly then embolium less wide than the length of the first antennal segment 5
4. Rostrum reaching apex of anterior coxae; eyes not contiguous with anterior margin of pronotum (fig. 61) (Central America) .... *TRYGO* Distant, 1884
— Rostrum reaching to or beyond middle coxae; eyes contiguous with anterior margin of pronotum (fig. 56) (South America) .... *CARIJOANUS* Carvalho, 1955
5. Eyes distinctly separated from pronotal collar this distance being about 1/3 or more length of one eye (figs. 65, 68, 257) 6
— Eyes contiguous with pronotal collar or nearly so (figs. 57, 59, 74) 10
6. Eyes large, occupying most of the sides of the head as seen from dorsal aspect (fig. 65), the distance between eye and collar equal to 1/3 or less the length of eye 7
— Eyes not noticeably large,occupying only anterior portion of head (fig. 68), the distance between eye and collar equal about length of eye 9

7. Second antennal segment incrassate towards the apex; pronotum strongly constricted anteriorly, long and erectly pilose; mesoscutum broadly exposed (Haiti) .... *FENNAHIELLA* Carvalho, 1955

– Second antennal segment not incrassate towards apex or if so then pronotum not strongly constricted anteriorly and body almost glabrous 8

8. Head about 2.5 times wider than long; first antennal segment 1.5 times or more longer than length of head; species usually over 4 mm. long (fig. 65) (South America) .... *HYALIODOCORIS* Knight, 1943

– Head only two times wider than long or less; first antennal segment usually less than 1.5 times longer as head; species usually less than 4 mm. long (West Indies & C. America) .... *PARACARNUS* Distant, 1884

9. Pronotum very coarsely punctate, with tubercular shining swellings; first antennal segment slightly longer than head; rostrum reaching the posterior coxae (Ecuador) .... *LYDE* Distant, 1893

– Pronotum without shining tubercular swellings (excepting carina); first antennal segment usually distinctly longer than head; rostrum reaching the middle coxae (North, Central & S. America) .... *HYALIODES* Reuter, 1876

10. Head strongly pointed in front (fig. 253); first antennal segment as long as width of one eye seen from above (Central America) .... *FUSCUS* Distant, 1884

– Head rounded in front; first antennal segment longer than width of eye seen from above 11

11. First antennal segment three times as long as length of head; second antennal segment as long as first; rostrum reaching the posterior coxae (fig. 52) (Central & South America) .... *ANNONA* Distant, 1884

– First antennal segment less than three times as long as length of head; second antennal segment longer than first segment 12

12. Pronotum strongly convex and declivous towards the head and margins; first antennal segment as long as width of vertex; clavus usually brack with an ocellate white spot (fig. 74) (Central & South America) .... *FLORUS* Distant, 1884

– Pronotum not noticeably convex of if so, then first antennal segment longer than width of vertex and clavus not as above 13

13. First antennal segment incrassate, usually distinctly longer than head; species usually over 4.5 mm. long (figs. 59, 64) (Central & South America) .... *PSEUDOCARNUS* Distant, 1884

— First antennal segment slender and about as long as head; species usually less than 4.5 mm. long (fig. 57) (Central & South America) .... *ANTIAS* Distant, 1884

KEY TO THE GENERA OF *DERAEOCORINI*

1. Second antennal segment broad and distinctly flattened (fig. 76) 24
— Second antennal segment linear or clavate (fig. 67) 2
2. Calli strongly raised and pointed at antero lateral angle; eyes set at middle of head; embolium very wide (Peru, Trinidad) .... *PERUANOCORIS* Carvalho, 1953
— Calli if convex not as above; eyes not set at middle of head but if so then embolium not noticeably wide 3
3. First antennal segment very short and thick, strongly narrowed basally, about as long as width of vertex; first tarsal segmen much thicker than the others with a tuft of hairs inferiorly; antennal peduncle very large (fig. 243) (Madagascar) .... *PAULIANANA* Carvalho, 1952
— First antennal segment not as above; first segment of tarsi if thick, then without the tuff of hairs; antennal peduncle not very large 4
4. Frons punctate (Egypt) .... *GRANOCAPSUS* Wagner, 1951
— Frons smooth 5
5. Frons transversely striate, the vertex sulcate (fig. 54) 6
— Frons more or less polished, scarcely striate, vertex not sulcate 7
6. Second antennal segment clavate; third and fourth short and thick, fusiform (North & South America) .... *DIPLOZONA* Van Duzee, 1915
— Antennae linear or nearly equal thickness throughout; second joint scarcely enlarged at apex, third and fourth linear (North & South America) .... *EUSTICTUS* Reuter, 1909
7. Hemielytra smooth, somewhat translucent, cuneus strongly inclined; body usually shining, clavo corial and embolio corial commissure at base with a row of punctures 8
— Hemielytra punctate 9
8. Body glabrous, cuneal fracture not noticeably wide and deep; hemielytra translucent (Central America) .... *CARMELUS* Distant, 1884
— Body pubescent, cuneal fracture wide and deep; hemelytra more or less opaque (Brazil) ....*LUNDIELA* Carvalho, 1951

9. Clypeus projecting beyond apex of first antennae; embolium very wide and thin ,fig. 55) (North & South America) .... *EURYCHILOPTERELLA* Reuter, 1909
— Clypeus not projecting beyond apex of first antennal segment; embolium not as above 10
10. Rostrum reaching to or slightly beyond anterior coxae; eyes removed from pronotum by a distance equal to at least one-half of its length; small glabrous species with strongly produced head and pronotum (fig. 66) 11
— Rostrum reaching middle or posterior coxae; eyes contiguous to pronotum or so; species if small, with head and pronotum not as above 12
11. Body finely punctate; second antennal segment incrassate towards apex, as thick as the first (Brazil) .... *ANNIESSA* Kirkaldy, 1903
— Body coarsely and deeply punctate; second antennal segment linear, much more slender than first (fig. 66) (Africa, Australia, China, Philippines) .... *FINGULUS* Distant, 1904
12. Pronotum carinate on lateral margins 13
— Pronotum not carinate on lateral margins 14
13. Hemielytra setose; eyes thick and erectly pilose (Australia, India) .... *CIMICAPSUS* Poppius, 1915
— Hemielytra not setose; eyes glabrous (New Zealand) .... *ROMNA* Kirkaldy, 1906
14. Second antennal segment distinctly clavate apically 15
— Second antennal segment not clavate apically 17
15. Cuneus strongly inclined; basal joint of hind tarsi thickened; membrane uniareolate, claval suture with a row of punctures; small species about 4 mm long (North America) .... *KLOPICORIS* Van Duzee, 1915
— Cuneus not strongly inclined or if so then corial suture without a row of punctures; species over 4 mm long 16
16. Deep black, polished species about 8 mm long; general aspect of *Deraeocoris* or *Capsus*; claws not distinctly toothed at base (North America) .... *DERAEOCAPSUS* Knight, 1920
— Species not deep black, usually less than 8 mm long; claws distinctly toothed at base (New Guinea) .... *ARASPUS* Distant, 1904
17. Scutellum hyaline, vitreous; body glabrous; eyes removed from pronotum by an espace equal to about twice the thickness of second antennal segment (fig. 246) (Africa) .... *YEBONIA* Carvalho, 1951

— Scutellum not hyaline or vitreous; if so, then eyes touching pronotum or body pubescent 18

18. Collar covered with a whitish dust-like powder; antennae with long setae and short hairs; head almost horizontal and produced between the bases of antennae (Europe, Asia) .... *ALLOEOTOMUS* Fieber, 1885

— Collar without the whitish dust above; antennae with single type of pubescence; head not noticeably horizontal or clearly produced between bases of antennae 19

19. Pronotum very strongly punctate, vertex distinctly carinate 20

— Pronotum if strongly punctate, then vertex not carinate .. 21

20. Body long and erectly pilose; second antennal segment with a few hairs and long erect setae (Tasmania) .... *PSEUDOCAMPTOBROCHIS* Poppius, 1911

— Body glabrous; second antennal segment without long erect setae (Australia) .... *EURYBROCHIS* Kirkaldy, 1902

21. Rostrum reaching the apex of mesosternum or middle coxae 22

— Rostrum reaching the posterior coxae 23

22. Second antennal segment a little incrassate near apex; clavus with a series of punctures following claval commissure (Java) .... *LAMPROCRANUM* Reuter, 1891

— Second antennal segment linear; clavus without a series of punctures following claval comissure (India) .... *DORTUS* Distant, 1910

23. First segment of rostrum reaching for beyond base of head; second segment of hind tarsi slightly longer than first (China) .... *CYPHODEMIDEA* Reuter, 1904

— First segment of rostrum reaching base of head; second segment of hind tarsi usually shorter or as long as first (Cosmopolitan) .... *DERAEOCORIS* Kirschbaum, 1855

24. First antennal segment very thick, the internal margin slightly rounded, the external sinuate; vertex sulcate longitudinally; second antennal segment longer than head and pronotum together; embolium wide (Brazil) .... *PIESTOTOMUS* Bergroth, 1922

— First antennal segment not noticeably thick, more or less straight; vertex smooth; second antennal segment shorter than head and pronotum together; embolium narrow (Brazil) ... . *AGASTICTUS* Bergroth, 1922

Note: The genus *Reuda* Buch. White, 1878, (Ent. Mo. Mag. 15: 132) from New Zealand is not included in this Key, due to its incomplete description.

KEY TO THE GENERA OF *SATURNIOMIRINI*

1. Calli with a V-shaped depression between them and a very distinct ocelloid structure laterally; pronotum punctate (New Guinea) .... *SATURNIOMIRIS* Kirkaldy, 1902
— Calli without a depression between them; pronotum smooth 2
2. Calli with three large fossae or depressions behind them; pronotum carinate laterally behind the calli (fig. 70) (Australia) .... *TRILACCUS* Horvath, 1902
— Calli with a continuous sulcus behind; pronotum not carinate laterally; an ocelloid shallow fossa laterally to calli present (New Guinea) .... *IMOGEN* Kirkaldy, 1905

KEY TO THE GENERA OF *BRYOCORINI*

1. Hemielytra without membrane on both sexes or the latter only vestigeal; clavus confluent with corium (fig. 137) .. 2
— Hemielytra with a distinct membrane at least on male; clavus and corium usually distinct (fig. 131) 4
2. Rostrum reaching the middle coxae; second antennal segment as thick as first segment; outer margin of corium rounded; aspect of coleoptera (fig. 137) (Brazil) .... *COLEOPTEROMIRIS* Carvalho, 1946
— Rostrum reaching the posterior coxae 3
3. Eyes pedunculate; second antennal segment more slender than first segment; inner margin of corium straight (fig. 231) (Mexico) .... *AZTECARIELLA* Carvalho, 1951
— Eyes not pedunculate; second antennal segment as thick as first segment; inner margin of corium strongly sinuate till the apical third (Cuba, San Domingos, Brazil) .... *HEMISPHAERODELLA* Reuter, 1908
4. Eyes on a suberect stylus which is at least as long as the width of one eye, the cuneus at most twice as long as wide (fig. 170) 5
— Eyes sessil or at most but substylate, in this case, cuneus more than twice as long as wide 7
5. Rostrum very short, not reaching the apex of anterior coxae; body with short, adpressed pubescence, the hemielytra rugosely punctate (Mentawei) ...... *SIPORIA* Poppius, 1915
— Rostrum reaching the posterior coxae or beyond it; body without adpressed pubescence; hemielytra punctate or smooth but never rugouse 6

6. Rostrum reaching beyond the posterior coxae; pygophore with a spiniform projection bent down; hemielytra distinctly punctured; first antennal segment about as thick as second (North & Central America) ...... *HESPEROLABOPS* Kirkaldy, 1902
— Rostrum reaching the posterior coxae only; pygophore without a spiniform projection bent down; hemielytra smooth or so; first antennal segment twice as thick as second (Central America) .... *NEOLEUCON* Distant, 1881
7. Eyes substylate with a short peduncle or if not, then cuneus very long and narrow, about three to four times as long as wide at base, with inner margin bent following the curvature of outer margin of membrane (figs. 127, 141, 149) 8
— Eyes not substylate, cuneus not as long and narrow as above, usually with straight margins 17
8. Apex of cuneus reaching the distal or apical margin of membrane (except females of *Neoneella* in this case, the rostrum reaching the base of abdomen) (figs. 141, 146) 9
— Apex of cuneus not reaching the distal or apical margin of membrane; the rostrum never reaching the base of abdomen (fig. 149) 12
9. Rostrum reaching at most to apex of middle coxae; species never reddish or luteous 10
— Rostrum ceaching the posterior coxae or beyond it; species with reddish or luteous colour 11
10. Rostrum reaching the middle of mesosternum; scutellum smooth; eyes not strongly recurved (Central & South Americas) .... *SPARTACUS* Distant, 1884
— Rostsum reaching apex of middle coxae; scutellum distinctly punctured; eyes strongly recurved (Java) .... *MICROBRYOCORIS* Poppius, 1914
11. Females with cuneus not reaching apex of membrane; cuneus of male very broad (fig. 146) (South America) .... *NEONEELLA* Costa Lima, 1942
— Females with cuneus reaching apex of membrane; cuneus of male very narrow — (India, Malay, Philippines) .... *THAUMASTOMIRIS* Kirkaldy, 1902
12. Second antennal segment longer than first segment; rostrum very short, reaching apex of first coxae; cuneus short (fig. 237) (Africa) .... *KUNUNGUA* Carvalho, 1951
— Second antennal segment longer than first segment; rostrum reaching beyond apex of first coxae 13
13. Calli very large with a deep median triangular depression; anterior area of pronotum smooth; eyes turned backwards reaching beyond posterior margin of head by a distance equal to

about 1/3 of length of eye; sides of hemielytra parallel (fig. 125) (Africa) .... *STENOPTEROCORIS* China, 1944
— Calli without a median triangular depression between them; collar punctate; eyes not as above; sides of hemielytra slightly widened at middle 14

14. Eyes sessil; first antennal segment slender only at extreme base; vertex convex 15
— Eyes strongly prominent, substylated; first antennal segment much slender on basal half or third; vertex concave and slightly sulcate 16

15. Collar as wide as the eye; the latter emarginate postero-internally, recurved over the collar (Java) .... *MYOCAPUS* Poppius, 1914
Collar not as wide as the eye; the latter out recurved backwardly over the collar (Central America) .... *NEOSILIA* Distant, 1884

16. Cuneus very narrow on apical half or throughout, somewhat curved; eye peduncle about as high as width of one eye (fig. 149) (C. & S. America, India, Malay) .... *SINERVUS* Stal, 1860
— Cuneus not noticeably narrow, more or less triangular; eye peduncle not as high as width of one eye (Africa, India) .... *PRODROMUS* Distant, 1904

17. Rostrum reaching the posterior coxae or beyond it or when this is not the case, color reddish or luteous and black 18
— Rostrum not extending beyond the apex of middle coxae 33

18. Small species, usually with orange or luteous and bluish or black color; males with a characteristic prong on left dorsal side of pygophore 19
— Species with other color pattern or if so then males without the prong on genital segment 20

19. Calli srongly convex (fig. 143) (Americas) .... *CAULOTOPS* Bergroth, 1891
— Calli not strongly convex (fig. 126) (North America) .... *HALTICOTOMA* Reuter, 1913

20. Rostrum reaching fourth abdominal segment or beyond it 21
— Rostrum not reaching the fourth abdominal segment 22

21. Collar strongly depressed, the apical corners of pronotum tuberculate; second antennal segment incrassate at apex, shorter than third; claval corial and costal veins with punctures and a row of bright hairs; cuneal fracture oblique, the cuneus short, rounded apically, oblique, with same width throughout (Venezuela) .... *PRISTONEURA* Reuter, 1892

— Collar not strongly depressed and apical corners of pronotum not tuberculate; veins of hemielytra not as above; cuneus slender at apex (Brazil) .... *STICTOLOPHUS* Bergroth, 1922

22. Pronotum smooth or rugouse 23

— Pronotum distinctly punctate, sometimes very finely so (fig.

23. Rostrum surpassing the apex of posterior coxae; femora incrassate; collar about as long as first antennal segment thick, head triangular (Borneo) .... *NOTIDIUS* Hsiao, 1944

— Rostrum not surpassing apex of posterior coxae; femora not incrassate; collar twice as long as first antennal segment thick; head rounded 24

24. Rostrum not reaching beyond hind coxae (Central America) .... *PACHYPODA* Carvalho & China, 1951

— Rostrum reaching the third abdominal segment (Java) .... *MAUROCORIS* Poppius, 1914

25. Pronotum with anterior portion strongly convex and somewhat hooded over the head, distinctly foveolate in the center of constriction; scutellum partially covered by truncate posterior margin of pronotum (Ceylon, Philippines) .... *ERNESTINUS* Distant, 1911

— Pronotum not as above; scutellum exposed 26

26. Eyes slightly stylate or prominent, curved posteriorly, touching apex of pronotum or protruding backward over lateral sides of the latter (fig. 171) 27

— Eyes sessil, not prominent or curved posteriorly 30

27. Color orange red and bluish metallic; hemielytra noticeably longer than abdomen, areola triangular its apex reaching much beyond apex of cuneus, veins densely pilose; second antennal segment with long, erect setae (Malay, Java) .... *MERTILA* Distant, 1904

— Color orange red or luteous, if bluish tinge present then hemielytra not noticably longer than abdomen, areola not as above, veins glabrous or nearly so; second antennal segment without long, erect setae 28

28. Large species over 5 mm with a basal excavation on scutellum, posterior margin of pronotum subtruncate (Central & South America) .... *NEELLA* Reuter, 1909

— Small species not over 4 mm long with convex scutellum, posterior margin of pronotum noticeably emarginate (Philippines) .... *KNIGHTIOLA* Hsiao, 1944

29. Hemielytra parallel; species without traces of luteous or reddish colour (fig. 150) 30

— Hemielytra distinctly or slightly widened at middle; species

luteous, orange or reddish with black or bluish metallic tinge (fig. 131) 31

30. Scutellum vonvex and smooth (Chile) .... *PACHYNEURRHIMENUS* Reuter, 1909

— Scutellum flat triangularly compressed in middle, the impression angulate (New Guinea) .... *PLATYPELTOCORIS* Poppius, 1912

31. First antennal segment about as long as half the width of vertex; pronotal collar somewhat hooded over the head; hemielytra very broad posteriorly (fig. 132) (Central & South America) .... *MECOLAEMUS* Hsiao, 1947

— First antennal segment longer than half the width of vertex; pronotal collar not hooded over the head; hemielytra not noticeably broad posteriorly 32

32. Hemielytra finely punctulate, without bluish metallic colour (India, Malay, Philippines, Australia) .... *BROMELIAEMIRIS* Schumacher, 1919

— Hemielytra smooth, with bluish metallic tinge (Central & South America) .... *TENTHECORIS* Scott, 1886

33. Rostrum short and usually very thick, reaching the anterior coxae 34

— Rostrum usually slender, reaching to middle of mesosternum or to middle coxae, sometimes extending to its apex or so 39

34. First antennal segment shorter than width of vertex; species with black hemielytra and luteous or reddish head and pronotum (fig. 123) 35

— First antennal segment as longa as or longer than width of vertex; small species without traces of luteous or reddish 36

35. Shining black species with head strongly produced inferiorly; pronotum noticeably narrowed anteriorly, glabrous, scutellum punctate; females macropterous, cuneus declivous, cuneal fracture deep and wide (Fig. 153) (Central & South America) .... *BOTHROPHORELLA* Reuter, 1907

— Color not as above, head not produced inferiorly; pronotum not noticeably narrowed anteriorly, pilose, scutellum only rugose; females usually brachypterous, cuneus horizontal, cuneal fracture shallow (fig. 142) (Europe, Asia) .... *BRYOCORIS* Fallen, 1829

36. Head not noticeably produced between the antennae below; frons smooth, eyes small, not curved posteriorly; collar wide (fig. 135) (South America) .... *ASPIDOBOTHRUS* Reuter, 1907

— Head strongly produced between the antennae below; frons striate; eyes and vertex somewhat curved posteriorly; collar narrow (figs. 123, 134, 136) 37

37. Pronotum glabrous, strongly shining; general color bluish metallic (fig. 136) (Central & South America) .... *EURYCIPITIA* Reuter, 1905

— Pronotum distinctly pilose; general color not bluish metallic 38

38. Small species, usually 4.5 mm long or less, with body strongly ovoid (fig. 123) (Central America) .... *DICRHOOCORIS* Reuter, 1909

— Species usually over 4.5 mm long, with body elongate (fig. 134) (Central & South America) .... *SYSINAS* Distant, 1883

39. Pronotum smooth, usually shining, sometimes rugose, but never punctate 40

— Pronotum punctate, sometimes finely but distinctly so .. 42

40. Pronotum raised in middle behind calli and produced ever the latter; hind femora curved with a deep excavation on the upper surface (Cuba) .... *NOTOLOBUS* Reuter, 1909

— Pronotum not as above; hind femora without an excavation 41

41. Pronotum not strongly narrowed in front; head without a neck; short, ovoid, dark and small species (Madagascar) .... *MONALOCOROPSIS* Poppius, 1914

— Pronotum strongly narrowed in front; head with a distinct neck, distinctly longer than wide; claval veins usually with a row of punctures (fig. 164) (Pacific Is. Madagascar) .... *FELISACUS* Distant, 1904

42. Small reddish or black and red species less than 4.5 mm long; second antennal segment about as thick as first, with unusually short pubescence; third and fourth segments very slender (fig. 196) (South America) .... *PACHYMEROCERUS* Reuter, 1909

— Species with other color or if so, the second antennal segment not as thick as first or beset with long, erect pubescence and larger than 4.5 mm long 43

43. Eyes produced out and backwards, their inner margin level with external margin of collar; the latter distinctly set off from pronotum by a posterior furrow as wide as thickest portion of first antennal segment (about as long as half the lenght of one eye or 0.12 mm) (India, Ceylon) .... *DIOCLERUS* Distant, 1910

— Eyes and collar not as above or if so, otherwise coloured 44

44. Pronotal collar ditinct not wider than width of second antennal segment, distinctly delimited from disc of pronotum, dark small species usually with light embolium, membrane finely densely pubescent (fig. 172) 45
— Pronotal collar indistinct or if distinct then wider than width of second antennal segment, usually not distinctly delimited from disc of pronotum, seldom small, dark pilose species if so membrane always glabrous (fig. 133) 47

45. First antennal segment longer than width of vertex, distinctly narrower on basal half; elongate, convex species with hemielytra parallel sided (Malay, Burma) .... *HEKISTA* Kirkaldy, 1902
— First antennal segment narrower only on basal third or extreme base; shorter or equal to width of vertex; ovoid species with hemielytra dilated at middle (fig. 172) 46

46. Cuneal fracture deep and very wide; cuneus curved externally; hemielytra flat (Mexico) .... *CYCLIDOLON* Reuter, 1909
— Cuneal fracture shalow and narrow; cuneus straight externally; hemielytra more or less convex (Cosmopolitan) .... *MONALOCORIS* Dahlbom, 1851

47. Small species mostly black with head porrect, apically acute, more or less triangular; first antennal segment about as long as or shorter than width of vertex; pronotum strongly piceous, usually inflated and much higher than the hemielytra (figs. 133, 148) 48
— Species without the above combination of characters 50

48. Hemielytra covered by silvery silky or woolly pubescence; outer margin of eyes about level with anterior margins ofp ronotum (fig. 133) (Central & South America) .... *CYRTOCAPSUS* Reuter, 1875
— Memielytra without silky or woolly pubescence; outer margin of eyes produced beyond anterior margin of pronotum by at least half the width of one eye (fig. 148) 49

49. Embolium narrow and incrassate; hemielytra with rather long, semierect pubescence, without silvery spots or areas; pronotum posteriorly moderately inflated (North, Central & S. America) .... *SIXEONOTUS* Reuter, 1875
— Embolium broadly expanded and flat; hemielytra with very fine, short and erect pubescence and silvery spots or areas; pronotum posteriorly greatly inflated (North, Central & South america) .... *PYCNODERES* Guerin & Men. 1856

50. Embolium very wide and conspicuous or swollen at middle always with a pit like depression or when this is not the case (female of *H. dilatatus*) body very strongly shining, bluish or

greenish metallic (figs. 156, 165) 51

— Embolium if modified, never with a pit like depression 52

51\. Body with metallic bluish or greenish colour; cuneus with a pit like depression, emboliar pit conspicuous, open towards the outside (fig. 165) ,(Cuba) .... *HETEROCORIS* Guerin & Men., 1856

— Body without metallic bluish or greenish colour; cuneus without a pit like depression, emboliar pit deep, round or oval, not open towards the outside (fig. 156) (Central America) .... *METAFURIUS* Carvalho & China, 1951

52\. Embolium distinctly laminate about, as wide as or wider than half the width of vertex; species with other colour than black (figs. 158, 168) 53

— Embolium not laminate, equally wide throughout, usually incrassate, realy narrowing toward apex, never as wide as half the width of vertex or if so, small and black species 55

53\. Embolium strongly dilated on based third so that the basal part of costa forms an obtuse angle with the apical part of costa (fig. 168) (Central & South America) .... *EMBOLIOCORIS* Carvalho & China, 1951

— Embolium laminate throughout, not noticeably widened on basal third, narrowing gradually toward apex 55

54\. Embolium strongly arcuate externally; scutellym with a tumid basal lobe projecting backwards and a flat, pointed apical fourth; body very long, fine and erectly pubescent eyes not recurved (New Caledonia) .... *GUNHADIA* Distant, 1920

— Embolium not strongly arcuate externally; scutellum not as above, convex; body with short, erect pubescence; eyes strongly recurved, collar somewhat hooded over the vertex (fig. 158) (Brazil) .... *ZIKANIOLA* Carvalho, 1946

55\. Embolium wide at base, narrowed toward apex, after the middle; costal vein with a row of punctures; body strongly rounded (New Guinea) ... *HEMISPHAEROCORIS* Poppius, 1912

— Embolium if wider at base, never with a row of punctures over costal vein; body not noticeably rounded 56

56\. Pronotum very coarsely and deeply punctate, glabrous, the size of the punctures equal to the width of second antennal segment (fig. 173) (Central America) .... *NOTOTREMATES* Carvalho & China, 1951

— Pronotum not noticeably coarsely punctate, pilose, size of the punctures smaller than width of second antennal segment 57

57. Head in dorsal view apically pointed; pronotum finely pubescent and punctured; hind tibiae linear (fig. 140) (Central America) ...... *KNIGHTOCORIS* Carvalho & China, 1951
— Head in dorsal view apically round; pronotum distinctly pubescent; hind tibiae usually thickened toward apex 58

58. Elytra with very long, erect, fine pubescence; male with first antennal segment toothed (fig. 150) (Central America) .... *ODONTOCEROCORIS* Carvalho & China, 1951
— Elytra with short adpressed pubescence, if erect or semierect then without a tooth in last antennal segment 59

59. Elytra parallel sided (fig. 150) 60
— Elytra wider across middle than at base or apex (fig. 122) 64

60. Head distinctly exserted, with a neck as long as the eyes which are placed about its middle (North America) .... *TYLOCAPSUS* Van Duzee, 1923 *
— Head not exserted, if a short neck is present, the eyes less distant from pronotum 61

61. Scutellum totally covered by pronotum (Central & South America) .... *PSEUDOBRYOCORIS* Distant, 1884
— Scutellum not covered by pronotum 62

62. Small, elongate dark species; pronotum with two distinct constrictions, collar and calli together about as long as disc; males with a wide and deep sulcus on frons, the vertex bifoveolate (India, Ceylon, Burma) ...... *HARPEDONA* Distant, 1904
— Species with a distinct color pattern; anterior portion of pronotum usually shorter than disc; males without the sulcus mentioned above 63

63. Pronotum flat, the cuneus very narrow and pointed (Philippines) .... *EOFURIUS* Poppius, 1915
— Pronotum more or less inflated convex; cuneus long and wide at base (Central America) ..... *NEOFURIUS* Distant, 1884

64. Elytra very oval and flat, with dense, short adpressed pubescence (fig. 122) 65
— Elytra very slightly widened in middle, with rather sparse erect or semierect pubescence 66

65. Second antennal segment more than twice as long as the first; division between corium and cuneus not distinct; species usually larger than 6 mm long (Central America) .... *MALA* Distant, 1881

* This genus was studied recently by the author and found to be a Synonym of *Macrolophus tieberi* (Duyphim).

— Second antennal segment less than twice as long as firts; division between corium and cuneus distinct; species usually less than 5 mm long (Central & South America) ....
.... *PARAFURIUS* Carvalho & China, 1951

66. Collar area somewhat projecting over base of head; second segment of antennae shorter than width of head; scutellum punctate (fig. 248) (Mexico) ....
.... *EURYCHILELLA* Reuter, 1909

— Collar area not projecting over base of head; second antennal segment longer than width of head; scutellum not punctate (Central & South America, New Guinea) ....
.... *ECCRITOTARSUS* Stål, 1860

Note: The following genera are not included in the key, since the types were not seen and the descriptions are incomplete:

Cobalorhynchus Reuter, 1906 (Ann. Mus. Zool. St. Petersb. 10: 1); China.

Lopidolon Poppius, 1911 (Ofv F. Vet. Soc. Forh. 53A (2): 7); India.

Perissobasis Reuter, 1892 (Ann. Soc Ent. Fr. 61: 397); Venezuela.

KEY TO THE GENERA OF *MONALONIINI*

1. Femora with two swellings at apex, the distal one large, balloon-like; scutellum smooth and flat (Java) ....
.... *ARTHRITICUS* Bergroth, 1923

- Femora not swollen at apex as above or if so, scutellum armed with one or more spines or processes 2

2. Scutellum flat or convex, sometimes bladder like or cystiform with tubercles, but never true spines or processes 5

— Scutellum armed with one or more spines or processes (figs. 120, 121, 159) 3

3. Scutellum with a single, very long and slender spine ending in a button like knob; antennae very long and linear; apex of corium without a shield shaped elevation (fig. 159) (Africa, India, Australia) .... *HELOPELTIS* Signoret, 1858

— Scutellum without a very long spine ending by a botton-like knob; antennae with segments incrassate apically or at middle; apex of corium with a shield shaped elevation 4

4. Scutellum with a thick, high, mushroom-like process; posterior angles of pronotum not produced into a flat spine; antennae with apices not balloon like inflated (fig. 121) (Africa) ....
.... *PHYSOPHOROPTERA* Poppius, 1910

— Scutellum with a medium process branched apically into a pair of short, pointed spurs; posterior angles of pronotum produced into a flat, pointed process; antennae with apices of joints inflated into balloon-like knobs (fig. 120) (Africa) .... *PHYSOPHOROPTERELLA* Poppius, 1914

5. Embolio corial and clavo corial suture without punctures; pronotum and hemielytra glabrous 6

— Embolio corial and clavo corial sutures with a row of close set punctures (high magnification); pronotum or hemielytra pubescent (fig. 139) 7

6. Second antennal segment little longer than first; apical angle of areolae or vein of membrane acute and pointed (Australia, Fiji) .... *EUCEROCORIS* Westwood, 1837

— Second antennal segment about six times as long as first; apical angle of areole or vein of membrane rounded (fig. 138) (Central & South America) .... *MONALONION* Herrich Schaeffer, 1850

7. Pronotum strongly wrinkled; rostrum reaching the middle of mesosternum (Africa) .... *PARARCULANUS* Poppius, 1912

— Pronotum smooth and shining; rostrum reaching the apex of anterior coxae 8

8. Frons strongly swollen, as seen from above produced well in front of eyes above base of clypeus; first antennal segment strongly thickened but glabrous; membrane with a spurious vein; calli prominent as two round, erect protuberances (Congo, Madagascar) .... *ARCULANUS* Distant, 1901

— Frons not swollen neither produced in front of the eyes above base of clypeus, anterior margin seen from above almost straight between and level with anterior margin of eyes; first antennal segment not inordinate thickened with erect hairs; membrane without spurious vein; calli not as erect protuberance 9

9. Embolium as wide as thickness of first antennal segment; pronotum covered by long setiform hairs (fig. 30) (Africa) .... *POPPIUSIA* China, 1944

— Embolium not as wide as thicness of first antennal segment; if so, frons with three tubercles; pronotum smooth or with common hairs only 10

10. Pronotum completely glabrous 12

— Pronotum pubescent 11

11. Frons with three tubercles bearing long hairs; body above and the antennae long and erectly pilose; cuneus short; areola with inner apical angle almost straight (Formosa, Malay) .... *EUPACHYPELTIS* Poppius, 1915

— Frons without tubercles; body above and antennae not noticeably long and erectly pilose; cuneus twice as long as wide; areolae with inner apical angle strongly acute (India, Malay, Pacific Is.) .... *PACHYPELTIS* Signoret, 1858

12. Hemielytra with short, adpressed pubescence (erect only on clavus); scutellum covered by pronotum at base (Indochina) .... *MANSONIELLA* Poppius, 1915

— Hemyelytra glabrous; scutellum not covered by pronotum at base (Australia) .... *PACHYPELTOPSIS* Poppius, 1912

KEY TO THE GENERA OF *ODONIELLINI*

1. Membrane of hemielytra with a number of auxiliary veins or vein-like impressions extending from basal cell to apex of membrane, the cubital vein distinct, arising from the basal angle of the cell and extending along anal margin (fig. 124) 2

— Membrane of hemielytra without such auxiliary veins, sometimes with a spurious vein arising from the apical angle of basal cell 3

2. Frons distinctly swollen and produced anteriorly between bases of first antennal segments, delimited from vertex by a sinuate impression, first antennal segment short and thick, shorter than length of head with neck, twice as long as wide, third segment very strongly thickened in middle, much thicker than first segment (fig. 124) (Africa) .... *PANTILIOMORPHA* Schumacher, 1917

— Frons feebly swollen and not produced anteriorly between bases of antennae, not delimited from vertex by a sinuate impression, first antennal segment less thickened, slightly longer than length of head with neck four times as long as wide, third segment not much thicker in middle than apex of second segment (Africa) .... *LYCIDOCORIS* Reuter & Poppius, 1911

3. Frons in front with three strong anteriorly or upwardly directed spines; first antennal segment densely beset with long, erect scale like hairs 4

— Frons without three of such spines; sometimes with two or three tubercular process in which case, the first antennal segment without scale like hairs 6

4. Last three antennal segments with short hairs; lateral spines of frons distinctly bent outwards (Africa) .... *CHAMOPSIS* Reuter & Poppius, 1911

— Last three antennal segments with long hairs; lateral spines of frons distinctly bent upwards (fig. 239) 5

5. Frontal spines very high, as long as the depth of one eye seen from side; pronotum with two lateral discal lobes; scale like hairs of first antennal segment very large (Africa) ....
.... *PARACHAMUS* Schouteden, 1946
— Frontal spines short, seen from side not as long as the depth of one eye; pronotum without lobes; scale like hairs of fisst antennal segment slender (fig. 239) (Africa) ....
.... *CHAMUS* Distant, 1904
6. Frons, above base of clypeus between antennae, with a pair of distinct conical protuberances, these rarely minute or fused into one in which case apex of second and third and fourth antennal segments strongly swollen; sometimes tubercles minute and setigerous and rather indistinct in which case pronotum, posterior laterally, strongly dilated, its margins serrate and pronotal collar armed with four tubercular processes (figs. 128, 129) 7
— Frons, above of clypeus between antennae without a pair of conical protuberances or setigerous tubercles, the frons sometimes prominent between antennae in which case apex of second antennal segment not or only slightly thickened 14
7. Pronotal collar with four tubercular processes, the inner pair elongate; surface of pronotum with ten erect conical processes in two rows, the two centre ones of posterior row of six, much longer and bigger than others; posterior lateral margins of pronotum dilated and serrate; scutellum split up into six lobes (fig. 169) (Africa) .... *YANGAMBIA* Schouteden, 1942
— Pronotal collar without erect tubercular processes; surface of pronotum without erect conical processes, the posterior margin of pronotum not serrate and scutellum not multilobate ... 8
8. Puncturation of pronotum deep and more or less regular, the surface without small, shining, tubercular swellings (fig. 129) 9
— Puncturation of pronotum less deep, rugousely confused, surface with small irregularly placed tubercular, shining swellings (fig. 128) 12
9. Scutellum strongly inflated, cystiform (fig. 129) 10
— Scutellum not noticeably inflated or cystifosm (Philippines)
.... *VOLKELIOPSIS* Poppius, 1915
10. Connexivum of abdomen largely exposed; scutellum not covering the clavus on sides; frontal tubercles longer than wide at base (fig. 128) (Spanish Guinea, Fernando Pó) ....
.... *BRYOCOROPSIS* Schumacher, 1917
— Connexivum of abdomen covered by the hemielytra or only slightly exposed; scutellum produced over the clavus laterally,

covering it almost entirely; frontal tubercles shorter than wide at base 11

11. Head seen from above with two distinct tubercles on anterior margins, the clypeus distinctly visible between them; scutellum hemispherical, widest in middle, the basal margin overlying pronotum arcuate (fig. 166) (Thibet) ....
.... *RHOPALICESCHATUS* Reuter, 1893

— Head seen from above with the anterior tubercles fused to form an anteriorly truncate process which hides the clypeus; scutellum shield shaped, widest at base, the basal margin overlying the pronotum, straight not arcuate (fig. 129) (New Britai) .... *PSEUDODONIELLA* China & Carvalho, 1951

12. Scutellum about as high as the pronotum, pointed apically; connexivum of abdomen usually covered by the hemielytra or so; form elongate 13

— Scutellum round, much higher than pronotum; connexivum of abdomen largely exposed; form ovoid (fig. 128) (New Guinea, New Britain) ....
.... *PARABRYOCOROPSIS* China & Carvalho, 1951

13. Hind tibiae distinctly nodulousely swollen; eyes small, only one quarter the width of vertex; acetabula of anterior legs large, visible from above on each side of anterior collar (fig. 147) (Africa) .... *DISTANTIELLA* China, 1944

— Hind tibiae simple, not nodulousely swollen; eyes large, about one half the width of vertex seen from above; acetabula of front legs small, not visible from above (fig. 145) (Africa)
.... *SAHLBERGELLA* Haglund, 1895

14. Rostrum extending to the posterior coxae 15

— Rostrum extending to the anterior or middle coxae 16

15. Hemielytra with minute scalelike hairs giving a shagreened appearence; connexivum not exposed; head pointed in front (Africa) .... *BOXIA* China, 1943

— Hemielytra without minute scales; connexivum largely exposed; head rounded in front (Malay) ....
.... *PLATYNGOMIRIS* Kirkaldy, 1902

16. Rostrum reaching to middle coxae; second antennal segment strongly incrassate at apex; clavus punctate (fig. 130) (Africa)
.... *VILLIERSICORIS* Delattre, 1950

— Rostrum reaching to anterior coxae or slightl beyond; second antennal segment not incrassate at apex; clavus not punctate 17

17. Third and fourth antennal segments distinctly clubshaped; scutellum convex, not higher than pronotum when seen from

side; hemielytra and scutellum densely pilose, moderately shining (Australia) .... *VOLKELIUS* Distant, 1904
— Third and fourth antennal segments more or less linear; scutellum strongly inflated, a little higher than pronotum when seen from the side; hemielytra and scutellum glabrous or slightly pilose, strongly shining (Africa) ....
.... *ODONIELLA* Haghlund, 1895

KEY TO THE GENERA OF *PHYLINI*

1. Black species, brachyperous; elytra without membrane, the corium, clavus and cuneus fused 2
— Species with other color or if black and brachypterous then the hemielytra with membrane or corium, clavus and cuneus not fused 3
2. Small species about 1.6 mm long; second antennal segment very thick, as wide as length of first segment (fig. 73) (Brazil) .... *TAPURUYUNUS* Carvalho, 1946
— Species about 4 mm long; second antennal segment cylindrical, not incrassate (Caucasus) ....
.... *HOMALANER* Kiritshenko, 1951
3. Second antennal segment of ionspicuous shape (fig. 93), strongly bent at middle like a letter U with a shorter arm; legs vesy long (Dutch Guiana) ....
.... *ANOMALOCORNUS* Carv. & Wygodz. 1945
— Second antennal segment linear or incrassate but never bent or U shaped; legs not noticeably long 4
4. Third antennal segment globose, beset with long, flattened hairs (fig. 00); pubescence of body erect, intermixed with silvery, flat hairs; species of small size and light color (North and Central America) .. *HAMBLETONIOLA* Carvalho, 1954
— Third antennal segment cylindrical, with common pubescence 5
5. Pronotum above distinctly punctured (fig. 74) 6
— Pronotum above smooth or very fine and indistinctly punctured 9
6. Pronotum with lateral margins explanate, straight, broadly and strongly reflexed; disc irregularly rugose; second antennal segment strongly reflexed; disc irregularly rugose; second antennal segment strongly clavate (North America) ....
.... *PRONOTOCREPIS* Knight, 1929
— Pronotum with lateral margins not reflexed or explanate; disc not rugose; second antennae not clavate 7

7. Tarsi of posterior tibiae very long, about as long as half the length of the latter; eyes very large (Turkestan) .... *BOOPIDOCORIS* Reuter, 1879
— Tarsi much shorter; eyes not very large 8
8. Pronotum coarsely punctured; dorsum brilliant metallic; two last antennal joints linear (Africa) .... *LAMPROSTHENARUS* Poppius, 1914
— Pronotum finely punctured; dorsum not metallic; two last joints of antennae fusiform (St. Helena) .... *AGRAMETRA* Buc. White, 1878
9. Eyes substylate, distant from pronotum; hemielytra transparent; first and second antennal segments incrassate (Brazil) (fig. 78) ....*CRASSICORNUS* Carvalho, 1945
— Eyes not substylate, contiguous with pronotum; hemielytra not transparent 10
10. Body beset with scale-like hairs or flattened silvery hairs intermixed with common pubescence (in the latter case usually tibial spines with black spots at base, eyes noticeably granulose, second antennal segment longer than width of head, rostrum reaching the posterior coxae or little beyond, vertex not carinate 11
— Body without scale-like or flattened silvery hairs intermixed with common pubescence (if silky or wooly hairs are present amongst other hairs, then without the set of characters pointed above) 30
11. Fairly large, dark species with head much wider than long, eyes substylate; vertex strongly carinate; body beset with dense, elongate whitish scale-like hairs; pseudoralia appressed to the claw, almost reaching its apex (Africa) .... *LASIOLABOPS* Poppius, 1914
— Usnall small species; if large, then the eyes sessile; pseudarolia not as above 12
12. Head transverse, frons vertical, not protruding in front of antennal bases as seen from dorsal aspect (fig. 77) 13
— Head produced in front of antennal bases, if not distinctly so then the scale-like pubescence black (fig. 82) 15
13. Espace between buccula and eye not greater than thickness of first antennal segment except in females where distance may exceed width of last antennal segment but does not equal its length (Americas) .... *RHINACLOA* Reuter, 1876
— Espace between buccula and eye greater than thickness of first antennal segment, usually subequal to length of segment 14

14. Second antennal segment five times length of first; hind tibiae with light spines without dark spots at base (Transcaspia) .... *STHENAROPSIS* Poppius, 1912
— Second antennal segment not over three times length of first; hind tibiae with black spines having dark spots at base (North America) .... *LEPIDOPSALLUS* Knight, 1923
15. Clypeus sharply produced, apex pointed (fig. 99) 16
— Clypeus not produced, vertical, the apex blunt (fig. 82) 17
16. Both sexes with second antennal segment strongly incrassate, about twice as long as first segment (Europe, North America) .... *EXCENTRICORIS* Carvalho, 1955
— Only the male with second antennal segment incrassate (about four or more times as long as first (Europe, Asia, North America) .... *CRIOCORIS* Fieber, 1858
17. Second antennal segment strongly thickened, much broader than the first (fig. 82) (Cosmopolitan) .... *ATRACTOTOMUS* Fieber, 1858
— Second antennal segment not strongly thickened, usually more slender than the first segment 18
18. Second antennal segment slightly compressed, thickest at middle were it is thicker than first, covered with very dense, fairly long, semierect black pubescence (Africa) .... *LEPIDOCAPSUS* Poppius, 1914
— Second antennal segment linear, not thicker than and not pubescent as above 19
19. Length of second antennal segment or equal to width of head across eyes 20
— Length of second antennal segment greater than width of head across eyes 21
20. Head inclined, produced in front of antennal bases; pubescence with erect and silvery deciduous hairs; first antennal as long as lorum (North America) .... *MEGALOPSALLUS* Knight, 1927
— Head rounded in front; pubescence mostly of sericeous deciduous hairs; first antennae longer than lorum (North America) .... *EUROPIELLA* Reuter, 1909
21. Scale-like pubescence black; a pseudo-pronotal collar present (Europe) .... *EXAERETUS* Fieber, 1864
— Scale-like pubescence silvery; a pseudo-pronotal collar absent 22
22. Hind tibiae with light spines having dark spots at base .. 23
— Spines of hind tibiae with other colour if light, then without dark spots at base 24

23. Body legs and antennae with minute fuscous or reddish spots; scales on cuneus black (Guatemala) .... *CAPELLANUS* Distant, 1904
— Body legs and antennae without minute fuscous or reddish spots; scales on cuneus not black (Ceylon) .... *DEMOPLESIA* Poppius, 1913
24. Hind tibiae with dark spines without dark spots at base 25
— Hind tibiae with dark spines having dark spots at base or with light spines without dark spots at base 27
25. Pseudarolia attached only at base of claw, tip free and extending to middle of claw (Americas) .... *REUTEROSCOPUS* Kikraldy
— Pseudarolia united with claw 26
26. Setiform hairs black, strong and erect, especially on vertex and anterior margin of pronotum (Algeria) .... *CHRYSOCHNODES* Reuter, 1901
— Setiform hairs yellow or whitish, long and fine (Europe) .... *PHYLIDEA* Reuter, 1899
27. Rostrum not reaching the apex of hind coxae or beyond it; head seen from above as long as pronotum (North America) .... *HOPLOMACHIDEA* Reuter, 1909
— Rostrum reaching the apex of hind coxae or beyond it; head seen from above shorter than pronotum 28
28. Clypeus prominent, distinctly visible from the side; antennae long, segment II linear, in male somewhat thicker apically, length equal to or greater than basal width of pronotum (Cosmopolitan) .... *PSALLUS* Fieber, 1858
— Clypeus nearly flat, scarcely visible from the side; antennal segment II rather short, length not over one-half or two-thirds the basal width of pronotum 29
29. Vertex carinate or marginate; third segment of hind tarsus longer than second (Cosmopolitan) Sthenarus Fieber...
— Vertex smooth, not marginate; third segment of hind tarsus shorter than second (Africa) .... *STENOCAPSUS* Bergroth, 1926
30. Pseudarolia arising from base of claw, free and convergent at apices 31
— Pseudarolia if free and arising from base of claw, never converging at apices 32
31. Head vertical, tibiae with black spots (Africa) .... *SCHROEDERIELLA* Poppius, 1914
— Head not vertical; tibiae without black spots (Africa, Madeira, Madagascar) .... *CEPHALOCAPSUS* Poppius, 1914

32. Length of second antennal segment lesse than width of head across eyes: in species in which the two are almost equal, hind femora light with dark spots (fig. 97) 33

— Length of second antennal segment greater than width of head across eyes; in species in which the two are almost equal, hind femora not light with dark spots 51

33. Light coloured species with femora yellow and beset with conspicuous black spots ((fig. 90) 34

— Dark coloured species or if light, femora black to dark brown or of femora light, then without dark spots (sometimes with light fucous points or cloudings) 39

34. Pubescence distinctly silky or woolly, adpressed; black spots of femora only on the external margins, not very conspicuous (Africa) .... *BRACHYCRANELLA* Reuter, 1905

— Pubescence with setiform or fine hairs, but not silky or woolly or adpressend, if so then black spots of femora large and irregularly placed 35

35. Rostrum reaching slightly beyond anterior coxae; pseudarolia free and paralell (Europe, North Africa) .... *MOISSONIA* Reuter, 1894

— Rostrum reaching the middle coxae or beyond it; pseudarolia connected with claw or not visible 36

36. Pubescence erect, bristle-like; tibiae strongly spinose, length of spines about twice the diameter of tibiae (North America) (fig. 191) .... *PHYLLOPIDEA* Knight

— Pubescence simple, not bristle-like; tibial spines shorter 37

37. Distance from lower apex of eye to buccula, seen from side, equal or less than half the height of eye; arolia visible (Cosmopolitan) .... *CAMPYLOMMA* Reuter, 1878

— Distance from apex of eye to buccula equal or about equal the height of one eye; arolia not visible (fig. 180) 38

38. Clypeus not extending backwards to a point beneath front margin of eye; as seen from side clypeus and juga narrow (Asia, Europe, North America) .... *ATOMOSCELIS* Reuter, 1878

— Clypeus extending backwards to a point beneath front margin of eye; as seen from side, the clypeus and jugum very broad (Algeria) .... *APHAENOPHYES* Reuter, 1899

39. Male antennae with first and second joint greatly thickened; hemielytra black with a pale mark on clavus; females sometimes brachypterous (fig. 97) (Americas) .... *SPANOGONICUS* Berg, 1883

— Hemielytra without a pale mark on clavus or if so, male antennae slender, scarcely thicker than in female; the latter macropterous 40

40. Pubescence setiform, stiff and black 41

— Pubescence very fine, erect or semiadpressed, not setiform 42

41. Pseudarolia almost reaching the apex of claw; first rostral segment reaching anterior coxae; dorsum and head not strongly hirsute (Europe) ...... *LITOXENUS* Reuter, 1885

— Pseudarolia reaching at most the middle of claw, first rostral segment scarcely surpassing the base of head; dorsum and head strongly hirsute (North America) .... *PHYLLOPIDEA* Knight, 1919

42. Pubescence very short, almost glabrous species with body more or less dull; tibial spines short and placed beyond the middle of tibiae 43

— Body distinctly pubescent, usually shining; tibial spines placed throughout the tibiae, relatively long 44

43. Sides of pronotum emarginate; head bluntly rounded in front; third segment of hind tarsi longer than second (fig. 37) (Europe, Asia, North America) .. *CONOSTETHUS* Fieber, 1858

— Sides of pronotum straight; head distinctly pointed in front; third segment of hind tarsi as long as second (fig. 100) (Europe) .... *STENOPARIA* Fieber, 1870

44. Head very wide, the posterior margin semicircular, the eyes prominent reaching backwards to the middle of pronotum (Egypt) ....*EURYCRANELLA* Reuter, 1904

— Head if wide, not with a semicircular posterior margin, the eyes never reaching backwards to the middle of pronotum 45

45. Hind femora pale without black or fuscous spots 46

— Hind femora black or fuscous or pale but in the latter case with some black or fuscous spots 47

46. Tibial spines pale; rostrum reaching apex of mesosternum; second antennal segment slightly incrassate toward the apex (Africa) .... *LEPTOXANTHUS* Reuter, 1905

— Tibial spines black; rostrum reaching apex of middle coxae or beyond; second antennal segment linear (Europe, Asia, Madeira) .... *MAURODACTYLUS* Reuter, 1878

47. Head seen from above strongly produced in front between the antennae (fig. 88) 48

— Head seen from above rounded in front, not or only slightly produced between the antennae 49

48. Body with silvery silky pubescence intermixed with fine hairs; tibial spines with dark spots at base (Formosa) .... *CEPHALOCAPSIDEA* Poppius, 1915
— Body with a single type of pubescence; tibial spines without dark spots at base (fig. 88, 235) (Central America) .... *RANZOVIUS* Distant, 1893

49. Tibial spines yellow; small species with apex of scutellum, a spot on corium and base of cuneus white (Africa) .... *TORMA* China, 1927
— Tibial spines dark, with or without dark spots at base; apex of scutellum and base of cuneus not white 50

50. Clypeus with a distinct suture at base; head narrow; apex of cuneus white (North America) .... *STROPHOPODA* Van Duzee, 1921 *
— Clypeus without a suture at base, confluent with frons; head wide; apex of cuneus concolorous (Cosmopolitan) .... *CHLAMYDATUS* Curtis, 1833

51. Pseudarolia large, reaching to or projecting slightly beyond apices of claws, connected with them or not; disc of prosternal xyphus depressed and with elevated margins (figs. 9, 10) 52
— Pseudarolia minute or not visible, never reaching tips of claws; disc of prosternal xyphus convex; margins not elevated (figs. 5, 8) 57

52. Rostrum reaching the middle coxae 53
— Rostrum reaching the hind coxae or beyond 54

53. Pubescence of body yellowish; hemielytra pale (North America) .... *NICHOLIA* Knight, 1929
— Pubescence of body black; hemielytra with dark points (Turkestan) .... *SCEODAMIA* Poppius, 1912

54. Pseudarolia not reaching beyond apices of claws; rostrum surpassing the hind coxae 55
— Pseudarolia reaching beyond the apices of claws; rostrum not surpassingt he posterior coxae (figs. 9, 10) 56

55. Head not strongly produced anteriorly; anterior margin of pronotum straight (Russia) ... *ETHELASTIA* Reuter, 1876
— Head strongly produced anteriorly; anterior margin of pronotum concave (Europe, N. Africa, N. America) .... *AMBLYTYLUS* Fieber, 1858

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* This genus was recently found to be a synonym of *Chlamydatus* Curtis (author).

56. Claw distinctly toothed at base; pseudarolia free, fused to claw only at base (fig. 10); clypeus strongly protruding (Europe, Asia, North Africa) ...... *MACROTYLUS* Fieber, 1858

— Claw not toothed at base; pseudarolia fused to claw in its greater or whole extension (fig. 9); clypeus not protruding (Europe, Asia, Africa, N. America) .... *LOPUS* Hahn, 1833

57. Margin of eye well separated from antennal fossa, minimum space between the two usually more than one third as great as diameter of antennal fossa; margin of eye near antennal fossa almost straight (fig. 95) 58

— Margin of eye almost or quite touching antennal fossa, minimum space between the two not more than one eighth as great as diameter of antennal fossa; margin of eye more or less emarginate near antennal fossa (fig. 85) 74

58. Lateral margin of pronotum widely reflected, sinuate before the posterior angles; legs very short; with black pubescence (Turkestan) .... *PLEUROXONOTUS* Reuter, 1901

— Lateral margins of pronotum not reflexed; legs not as above 59

59. Body with black setiform hairs only (sometimes easily rubbed off) 60

— Body with golden or yellow fine pubescence only or with setiform hairs intermixed with silky hairs 65

60. Rostrum reaching the mesosternum; pubescence very short; frons tumid, striolate (Algeria) .... *EUDERON* Puton, 1888

— Rostrum reaching the apex of middle coxae or beyond; pubescence not noticeably short; frons not striolate 61

61. Rostrum reaching the apex of middle coxae; xyphus of prosternum impressed at middle, obtusely marginate (Siberia) ... . *IBIARIS* Horvat & Reuter, 1900

— Rostrum reaching the posterior coxae or beyond; xyphus of prosternum not marginate, if so, the rostrum reaching the 5th abdominal segment 62

62. Rostrum reaching the posterior coxae; xyphus of prosternum with two parallel impressed lines at apex (Asia Minor) .... *UTOPNIA* Reuter, 1881

— Rostrum reaching the Vth abdominal segment or beyond; xyphus of prosternum without the two impressed lines mentioned above 63

63. Rostrum reaching the genital segment; xyphus of prosternum convex, without incrassate margins (Europe, Asia, North Africa) .... *PACHYXYPHUS* Fieber, 1858

— Rostrum reaching at most the Vth abdominal segment; xyphus of prosternum plane with margins incrassate 64

64. Head distinctly transverse, first antennal segment not reaching or extending beyond apex of clypeus, inserted close to apex of eye (Asia Minor) .... *OPISTHOTAENIA* Reuter, 1901

— Head as long as wide; first antennal segment reaching quite beyond apex of clypeus, inserted not close to the apex of the eye (Europe, Asia, North Africa) .... *THERMOCORIS* Puton, 1875

65. Rostrum reaching the apex of anterior coxae or very slightly beyond; second antennal segment shorter than third (fig. 89) ((Europe, Asia, North Africa) .... *HARPOCERA* Curtis, 1838

— Rostrum reaching beyond the apex of first coxae; second antennal segment longer than third 66

66. Antennae with the second joint incrassate toward the apex; genae without long hairs (Europe) .... *CREMNORRHINUS* Reuter, 1880

— Antennae slender or incrassate, the second joint narrowed toward the apex, linear or so; genae with long hairs or setae 67

67. Body with a single type of pubescence, pallid, yellowish or golden, semiadpressed; first antennal segment dark (Europe) .... *MONOSYNAMMA* Scot, 1864

— Body with silky, bright pubescence intermixed with setiform hairs; first antennal segment light with one or more black setae 68

68. Fairly large black species; rostrum reaching the posterior coxae; tibiae black (Siberia) ...... *NYCTIDEA* Reuter, 1904

— Species of small or medium size, not black; the tibiae light 69

69. Rostrum reaching distinctly beyond the posterior coxae; head strongly pointed in front 70

— Rostrum not surpassing the posterior coxae; head not strongly pointed in front 71

70. Tibial spines with black spots at base; second segment if hind tarsus shorter than third (Europe) .... *ALLOEOTARSUS* Reuter, 1885

— Tibial spines without black spots at base; second segment of hind tarsus longer than third (Europe, Asia, North Africa) .... *MEGALOCOLEUS* Reuter, 1890

71. Rostrum reaching the posterior coxae; xyphus of prosternum convex, not carinate; hind tibiae with dark spines without dark spots at base 72
— Rostrum not reaching beyond the middle coxae; sides of xyphus distinctly carinate; hind tibiae with dark spines having dark spots at base 73
72. Xyphus of prosternum convex and smooth; pubescence not noticeably long and dense (Europe, North Africa) .... *HADROPHYES* Puton, 1874
— Xyphus of prosternum with a median carina; pubescence very long and dense (Algeria) .... *DASYCAPSUS* Poppius,1912
73. Small species with long, slender second antennal segment; the silky pubescence long and irregular; hemielytra with a dark spot at apex of corium (Europe, Asia) .... *CAMPTOTYLUS* Fieber, 1860
— Usually large species; second antennal segment usually thick; silvery pubescence scanty and short; hemieltra without a black spot at apex of corinm (Europe, Asia, North America) .... *ONCOTYLUS* Fieber, 1858
74. Rostrum raching the posterior coxae or beyond it; if shorter, tibiae with black spines and dark spots at base 75
— Rostrum not or surprassing slightly apex of mesosternum (exceptionally reaching middle coxae) 105
75. Body beset with silky or woolly pubescence or this type plus setiform hairs or *true hairs* only 76
— Body beset with black setiform hairs only, without silky or woolly pubescence 103
76. Vertex distinctly and strongly carinate posteriorly 77
— Vertex not carinate posteriorly or only very finely so ... 79
77. Posterior femora without rigid erect setae on anterior margin 78
— Posterior femora with several rigid and erect setae on anterior margin (Europe, Asia and N. Africa) .... *PSALLOPSIS* Reuter, 1901
78. Rostrum surpassing slightly the hind coxae; eyes not reaching beyond anterior margins of pronotum; pubescence not noticeably long and stiff (Asia Minor and N. Africa) .... *PARAMIXIA* Reuter, 1900
— Rostrum reaching the apical third of abdomen; eyes reaching beyond anterior margins of pronotum; pubescence very long and stiff (Guam Is.) ...... *PSALLOPS* Usinger, 1946
79. Rostrum very long, extending to the 8th or 9th abdominal segment; calli well developed 80

— Rostrum if surpassing the posterior coxae not reaching the 8th abdominal segment; calli small, indistinct 82

80. First antennal segment as long as width of vertex; rostrum reaching the last abdominal segment (Europe, N. Africa, N. America) .... *TINICEPHALUS* Fieber, 1858

— First antennal segment shorter than width of vertex; rostrum not reaching the last abdominal segment 81

81. Femora and tibiae with black or coloured spots; auxiliary veins present in membrane (Europe, Asia) .... *SOLENOXYPHUS* Reuter, 1875

— Femora and tibiae unicolour; membrane without auxiliary veins (Asia Minor) .... *VORUCHIELLA* Popius, 1912

82. Tibiae without distint spines; very small species, chocolate brown with whitish marks at base of pronotum, hemielytra, apex of scutellum, corium and cuneus (Rodriguez Is.) .... *TREVESSA* China, 1924

— Tibiae with distinct spines; species usually over 2 mm. long; colour not as above 83

83. Pubescence very short, sparse and adpressed; pronotum, head and scutellum almost glabrous; hemielytra with a riddish transverse fascia on apex of corium (Europe, N. Africa) .... *MEGALODACTYLUS* Fieber, 1858

— Pubescence usually longer and semierect, if short then reddish transverse fascia on apex of corium absent 84

84. Pubescence of hemielytra composed of bright silky or woolly adpressed hairs intermixed with black, setiform ones 85

— Pubescence of hemielytra yellowish or dark, but never with two types of hairs 86

85. Legs pale without dark spots or points (Europe, N. America) .... *ASCIODEMA* Reuter, 1878

— Legs dark or fuscous, if pale with dark spots or points (North America) .... *MEGALOPSALLUS* Knight, 1927

86. Hind tibiae with black spines, these spines without dark spots at base (sometimes only a faint cloud, but not a definite spot) 98

— Hind tibiae usually with light, yellow or colourless spines, if dark spines, then with distinct black spots at their bases 87

87. Pale greenish species; tibiae with black spines having dark spots at base; females brachypterous, male with second antennal segment incrassate (Europe) .... *MALACOTES* Reuter, 1878

— Species with other colour than pale greenish, but if so, then females macropterous and males with second antennal segment linear and slender 88

88. Hind tibiae with dark or black spines, usually with dark spots at base 87

— Hind tibiae with yellow or colourless spines 90

89. Vertex finely carinate; male with a prong on genital segment; calli not distinct (Africa) ....
.... *PLAGIOGNATHIDEA* Poppius, 1914

— Vertex not carinate; males without a prong on genital segment (Cosmopolitan) .... *PLAGIOGNATHUS* Fieber, 1858

90. Tibial spines with fuscous spots at base 91

— Tibial spines without dark or fuscous spots at base 92

91. First rostral segment not reaching beyond base of head (China) .... *LEUCODELLUS* Reuter, 1906

— First rostral segment reaching beyond base of head (Algeria) .... *COMPSONANNUS* Reuter, 1902

92. Females usually brachypterous; sides of pronotum emarginate at middle, the calli large and tumid (Europe) ....
.... *ORTHONOTUS* Stephens, 1829

— Females always macropterous; sides of pronotum not emarginate at middle; calli small and flat 93

93. Second antennal segment at least in male strongly incrassate; rostrum not reaching beyond posterior coxae (Europe, Asia) .... *BRACHYARTHRUM* Fieber, 1858

— Second antennal segment slender in both sexes; rostrum reaching slightly beyond the posterior coxae 94

94. Third segment of hind tarsus as long as first and second together (Europe, N. Africa) .... *PLESIODEMA* Reuter, 1875

— Third segment of hind tarsus shorter than first and second together 95

95. First rostral segment not reaching xyphus of prosternum; head fairly oblique (Europe, Asia, N. Africa) ....
.... *PHYLUS* Hahn, 1831

— First rostral segment reaching about the basal third of xyphus of prosternum; head fairly vertical 96

96. Hamus of areola and connecting vein diverging close to the base (Turkestan) .... *TORUCHILA* Reuter, 1879

— Hamus of areola and connecting vein not diverging close to the base 97

97. Head vertical; second and third segments of hind tarsus subequal in length (china) ... *EUCHARICORIS* Reuter, 1906

— Head subvertical; third segment of hind tarsus shorter than second (Europe) .... *ICODEMA* Reuter, 1875

98. General colour greenish-yellow or greenish-white minute fuscous spots on corium 99

— General colour dark red or brown to black; if greenish then the corium without fuscous spots; pubescence not strongly silky and uneven 100

99. Pubescence distinctly silky and uneven; rostrum reaching the apex of middle coxae (Indian, Tibet) .... *TIBETOCORIS* Hutchinson, 1934

— Pubescence not distinctly silky or uneven; rostrum reaching a little beyond posterior coxae (Russia, Turkestan) .... *MALTHACOSOMA* Reuter, 1879

100. General colour greenish yellow 101

— General colour dark red, brown or black 102

101. Eyes slightly removed from pronotum; clypeus strongly prominent (fig. 182) (Europe, Asia) .... *PAREDROCORIS* Reuter, 1878

— Eyes contiguous with pronotum; clypeus vertical, not noticeably prominent (fig. 96) (Europe, Asia, N. Africa, N. America) .... *TUPONIA* Reuter, 1875

102. Second antennal segment slightly swollen at apex, so as to become as wide as first segment; general colour dark red (North America) .... *RHINOCAPSUS* Uhler, 1890

— Second antennal segment linear, not so wide as first segment; rarely with reddish (North America) .... *MICROPHYLELLUS* Reuter, 1909

103. Xyphus of prosternum convex, sides not carinate (Europe, Asia) .... *PLACOCHILUS* Fieber, 1858

— Xyphus of prosternum flat, the margins obtusely subincrassate 104

104. Rostrum reaching beyond the hind coxae; first segment reaching beyond the middle of xyphus of prosternum; posterior tibiae without dark spots (Caucasus) .... *DAMIOSCEA* Reuter, 1884

— Rostrum reaching the posterior coxae, the first segment not reaching the middle of xyphus of prosternum; posterior tibiae with dark spots (Europe, Asia, Africa) .... *HOPLAMACHUS* Fieber, 1858

105. Pronotum strongly declivous with two dark spots behin the cali; fairly large species (N. Africa) .... *ROUDAIREA* Puton & Reuter, 1886

— Pronotum not as above 106

106. Vertex very strongly carinate, the carina arcuate sinuate anteriorly; head transverse and vertical, the antennae very thick (North America) ...... *MYOCHROOCORIS* Reuter, 1909

— Vertex not carinate as above; antennae slender, or if thick, then pronotum carinate leterally 107

107. First antennal segment very thick; pronotum carinate laterally; rostrum reaching only apex of anterior coxae (fig. 87) (Europe, Asia, N. Africa) .... *NASOCORIS* Reuter, 1879

— First antennal segment not noticeably thick; pronotum not carinate laterally; rostrum reaching beyond apex of anterior coxae 108

108. Sides of pronotum distinctly emarginate; eyes slightly removed from anterior margin of pronotum (fig. 98) (Europe, Asia, N. Africa) .... *EURYCOLPUS* Reuter, 1879.

— Sides of pronotum straight or sinuate; eyes contiguous with anterior margin of pronotum 109

109. Small, strongly shining dark brown species with a whitish area on middle of hemielytra (clavus, corium, sometimes scutellum); pubescence very scanty, subglabrous; coxae and middle of mesosternum whitish (Europe, Asia, N. Africa) .... *AUCHENOCREPIS* Fieber, 1858

— Species if dark brown, not strongly shining and subglabrous; whitish area of hemielytra absent 110

110. Pubescence black, setiform, intermixed with fine, whitish hairs (sometimes the setiform hairs are present only on sides of pronotum and apex of corium); hemielytra without minute dark or fuscous spots 111

— Pubescence fine, whitish, no black setiform hairs present 116

111. Femora with black or fuscous spots 112

— Femora without black or fuscous spots 114

112. Black spots of femora only on inferior margin; second antennal segment much longer than width of head (Mongolia) .... *AGRAPTOCORIS* Reuter, 191

— Black spots of femora on both sides; second antennal segment slightly longer than width of head 113

113. Vertex margined posteriorly, as well as, the sides of pronotum; hemielytra very finely punctured (Asia, India) .... *PARARAGMUS* Poppius, 1911

— Vertex and pronotum not margined; hemielytra with dark and golden hairs (India) .... *RAGMUS* Distant, 1910

114. Body with a few setiform hairs; rostrum reaching the apex of middle coxae; first segment of hind tarsus much shorter

than second (Asia, Europe) .... *LEUCOPTERUM* Reuter, 1879

— Body pubescence very dense; body with black hairs (numerous)o rostrum reaching the middle coxae (base); elytra with small dots 115

115. Hemielytra with dark or brown spots; strongly shining; pseudarolia reaching the middle of claw (Africa) .... *PARASCIODEMA* Poppius, 1914

— Hemielytra without dark or brown spots, not strongly shining; pseudarolia minute (Europe, N. Africa) .... *TRAGISCOCORIS* Fieber, 1861

116. First antennal segment very short, as long as the length of clypeus; reddish species with whitish area on middle of clavus and base of cuneus; head black (Turkestan) .... *EPHIPPIOCORIS* Poppius, 1912

— If the first antennal segment very short, colour not reddish as above, head not black 117

117. External incisure of cuneal fracture deep; second antennal segment of male incrassate toward apex (China) .... *ECTENELLUS* Reuter, 1906

— External incisure of cuneal fracture not deep; second antennal segment of male linear 118

118. Hemielytra black or brownish black, base of cuneus with two whitish spots; second antennal segment as thick as or thicker than first segment (Ceylon) ...... *SEJANUS* Distant, 1190

— Hemielytra with several minute or dark or orange spots; second antennal segment more slender than first segment 119

119. First rostral segment reaching only about middle of eye; hemielytra with some medium sized spots (Egypt) .... *ECTAGELA* Schmidt, 1939

— First rostral segment reaching xyphus of prosternum; hemielytra with several minute dark spots 120

120. Head produced between bases of antennae; eyes not noticeably large; tibiae without fuscous spots at base of spines (Europe, Asia Minor, N. Africa .. *PASTOCORIS* Reuter, 1879

— Head not produced between the bases of antennae; eyes very large; tibiae usually with fuscous spots at the base of spines (Asia Minor, North Africa) .. *ATOMOPHORA* Reuter, 1879

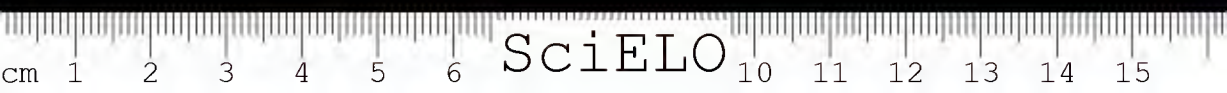
The following genera are not included in the key:

Decomia Poppius, 1915 (Arch. f. Naturges. 80 A (8): 73); Formosa.

Oligobliella Reuter, 1885 (Ent. Mo. Mag. 21: 201 ; St. Helena.
Phoenicocapsus Reuter, 1876 (Pet. Nouv. Ent. II: 54); Europe.
Taeniophorus Linnavuori, 1952 (Ann. Ent. Fenn. 18 (1): 36); Turcmenia (near *Icodema* Reuter).
Psallomimus Wagner, 1951 (Bul. Soc. Fouad I Ent. 35: 149); Egypt.

KEY TO THE GENERA OF *DICYPHINI*

1. Body above smooth, rarely very finely or superficially punctate, more or less slender 2
— Body above coarsely and deeply punctate, thick and rounded (fig. 74) 16
2. Small cell of membrane with a distinctly marked black spot (Africa) .... *HAEMATOCAPSUS* Poppius, 1914
— Small cell of membrane without a dark spot 3
3. Eyes contiguous with anterior margin of pronotum (fig. 157) 4
— Eyes more or less removed from anterior margin of pronotum (figs. 161, 162) 7
4. Pronotum constricted anteriorly, the anterior lobe produced forward covering the collar; head sulcate on vertex; arolia arising from the claw but converging at apices (fig. 160) (Samoa) .... *ONCONOTELLUS* Knight, 1935
— Pronotum if constricted anteriorly, without a lobe as above; head not sulcate and arolia not converging at apices 5
5. Rostrum reaching the apex of posterior coxae or beyond (Africa) .... *DICYPHOPSIS* Poppius, 1914
— Rostrum reaching the apex of middle coxae 6
6. Second antennal segment incrassate toward the apex; large cell of membrane almost rectangular (Europe, Africa) .... *CAMPYLONEUROPSIS* Poppius, 1914
— Second antenna segment linear; large cell of membrane rounded apically (fig. 157) (Africa) .... *CAMPYLONEURA* Fieber, 1860
7. Both sexes brachypterous; body covered with long and sigid setae; pronotum as long as wide; abdomen entirely exposed (Australia) .... *SETOCORIS* China & Carvalho, 1951
— Both sexes macropterous or if one sex brachypterous, then the abdomen partially covered 8

8. Neck strongly constricted towards the pronotum, behind the eyes (Africa) .... *ORTHOTILIDEA* Poppius, 1914
— Neck not noticeably constricted behind the eyes 9
9. Eyes situated distinctly in front of the middle of the head; the neck very long (Africa) .... *MACROLOPHIDEA* Poppius, 1914
— Eyes situated behind the middle of the head or occupying a median position 10
10. Collar and pronotum very narrow, the sides of pronotum carinate (Africa) .... *HYALOSOMELLA* Poppius, 1914
— Collar not very narrow; sides of pronotum not carinate 11
11. Eyes removed from pronotum by a distance about equal to the thickness of second antennal segment (fig. 167) (Cosmopolitan) .... *CYRTOPELTIS* Fieber, 1860
— Eyes removed from pronotum by a distance much greater than the thickness of second antennal segment (fig. 161) 12
12. Eyes very small, separated from pronotum by more than length of eye seen from above; head about as long as wide 13
— Eyes relatively large, separated from pronotum by a distance equal to or less than length of eye seen from above; head slightly wider than long 14
13. Cuneus more than three times as long as wide; frons not produced between the antennae; first antennal segment shorter than width of head (fig. 163) (Central America) .... *CHIUS* Distant, 1884
— Cuneus about twice as long as wide; frons produced between the antennae; first antennal segment as long as width of head (fig. 161) (Europe, Americas, Africa) .... *MACROLOPHUS* Fieber, 1858
14. Cuneus long and narrow, about three times longer than wide at base; pronotum not constricted at middle (India) .... *ABIBALUS* Distant, 1909
— Cuneus slightly longer than wide at base; pronotum constricted at middle 15
15. Vertex slightly carinate at the sides; posterior angles of pronotum not produced; scutellum without sulcus (fig. 42) .... (Cosmopolitan) .... *DICYPHUS* Fieber, 1858
— Vertex completely smooth; basal margin of pronotum strongly emarginate, the posterior angles produced; scutellum with a longitudinal sulcus at base (Africa) .... *BUCOBIA* Poppius, 1914

16. Neck strongly narrowed behind the eyes; incision of cuneal fracture very deep and wide when the wing is in horizontal position (India) .... *ANGERIANUS* Distant, 1904
— Neck not strongly narrowed behind eyes incision of cuneal frature not as above 17

17. Pronotum with shining tubercular swellings; scutellum with a short tubercular process (Europe, Asia) .... *STETHOCONUS* Flor, 1861
— Pronotum without shining tubercuar swellings; scutellum without a tubercular process 18

18. Eyes distant from anterior margin of pronotum, very small 19
— Eyes contiguous with anterior margin of pronotum 20

19. Hemielytra and scutellum punctate, the latter flat (Madagascar) .... *CYCHROCAPSUS* Poppius, 1914
— Hemielytra and scutellum smooth, the latter strongly convex (fig. 162) (Borneo) .... *APOLLODOTIDEA* Hsiao, 1944

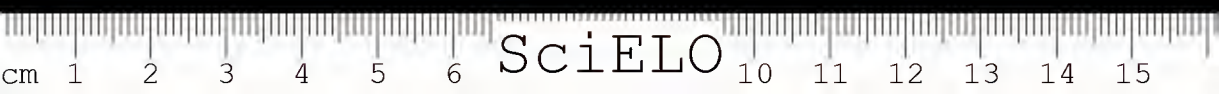
20. Rostrum reaching the apex of posterior coxae; scutellum smooth (Madagascar) .... *HILDEBRADTIELLA* Poppius, 1944
— Rostrum reaching apex of middle coxae; scutellum punctate (New Caledonia) .... *TERATOCAPSUS* Poppius, 1911

NOTE: The genus *Isoproba* Osborn & Drake, 1915 (Ohio Nat. 15) is not included in this key because it could not be placed from its original description and no specimens were examined. *Habrocoris* Wagner, 1951 runs in this key with *Dicyphus* Fieber, and *Bucobia* Poppius.

KEY TO THE GENERA OF *HALLODAPINI*

1. Pseudarolia large reaching or not quite reaching apex of claw; species of large size, elongate (fig. 11) 2
Pseudarolia minute, not as above (figs. 14, 15, 16) 4

2. Second antennal segment strongly clavate apically, its thickness at apex more than twice that of base; rostrum reaching almost to hind coxae; hemielytra fully developed in both sexes (North America) .... *TELEOPHINUS* Uhler, 1890
— Second antennal segment linear or slightly incrassate at apex; rostrum reaching middle coxae; females brachypterous or wingless 3

3. Second antennal segment linear; pseudarqolia attached at base of claw, free apically; females wingless (North America) .... *COQUILLETTIA* Uhler, 1876

— Second antennal segment slightly incrassate at apex; pseudarolia completely jointed to claw; females brachypterous (North America) .... *ORECTODERUS* Uhler, 1876

4. Hemielytra with sharply delimited whitish or yellowish white transverse fasciae or spots or elongate markings; seldom uniformily pale but then long and erectly pilose 9

— Hemielytra without sharply delimited whitish or yellowish white transverse fasciae or spots or elongate markings; on the clavus and on the corium there is seldom a very small yellow transverse spot, this same spot however on the clavus lies far in front of that on the corium and is posteriorly bordered by a deep velvety black elongate spot 5

5. Body above with long, erect and black bristles; ground colour dirty greysh yellow (Africa) .... *TRICHOPHORELLA* Reuter, 1905

— Body above usually with short, erect hairs or if these are dark then the dorsum black 6

6. Dorsum with short, erect dark bristles (Africa) .... *BIBUNDIELLA* Poppius, 1914

— Dorsum without short, erect dark bristles 7

7. Dorsum totally black, clavus and corium with a small yellow transverse spot (Africa) .... *SYNGONUS* Bergroth, 1926

— Dorsum not totally black 8

8. Dorsum with short, adpressed, yellowish pubescence; pronotum not longitudinally sulcate at middle of base (India) .... *AZIZUS* Distant, 1910

— Dorsum with short, erect, whitish bristles; pronotum with a longitudinal sulcus at middle of base (North Africa) .... *AEOLOCORIS* Reuter, 1904

9. Pronotum distinctly punctate (fig. 74) 10

— Pronotum smooth or very finely rugouse 13

10. Underside long and erectly pilose; tibiae with long bristles 11

— Underside not long and arecty pilose; tibiae without bristles 12

11. Body above long and erectly pilose (Brazil) .... *AMAZONOCORIS* Carvalho, 1952

— Body above with short and adpressed pubescence (Bolivia) .... *EUCERELLA* Poppius, 1921

12. Two last antennal segments thinner than second; pronotum wider than long, the lateral margins straight; scutellum without a basal lobe (Africa) ...... *TYLOPELTIS* Reuter, 1904

— Two last antennal segments about as thinck as second; pronotum about as long as wide; the lateral margins rounded;

scutellum with a basal blunt lobe almost as high as pronotum (Somaliland, Togo) .... *GLOSSOPELTIS* Reuter, 1904

13. Scutellum of male with a high, erect spine like projection, as high as or higher than pronotum (fig. 213) 14

— Scutellum of male unarmed, sometimes strongly convex or tumid, if so, never as high as disc of pronotum 17

14. Anterior portion of pronotum with two erect spinelike processes (fig. 84) (India, Malay, Borneo) .... *NICOSTRATUS* Distant, 1904

— Anterior portion of pronotum without the above mentioned processes 15

15. Scutellar spine directed forwards; rostrum reaching apex of middle coxae; antennae inserted near the eye (North America) .... *HEIDEMANNIELLA* Poppius, 1914

— Scutellar spine directed backwards; antennae inserted far from the eye (fig. 229) 16

16. Rostrum reaching apex of anterior coxae; second antennal segment not strongly incrassate; scutellar spine short (Turkestan, Africa) .... *ASPIDACANTHUS* Reuter, 1901

— Rostrum reaching posterior coxae; second antennal segment strongly incrassate towards apex; scutellar spine long (fig. 229) (Africa) .... *MYOMBEA* China & Carvalho, 1951

17. Eyes distant from the pronotum by a space about equal the width of vertex (fig. 81) 18

— Eyes contiguous with the pronotum or removed from it by a distance about equal to half the width of vertex (brachypterous females) or much less (males) (fig. 86) 19

18. Eyes pilose; disc of pronotum strongly convex posteriorly; hemielytra long, reaching distinctly beyond apex of abdomen (fig. 81) (India) .... *SOHENUS* Distant, 1910

— Eyes glabrous; disc of pronotum not noticeably convex posteriorly; hemieytra only covering apex of abdomen (Europe, Asia, Africa) .... *ALLOEOMIMUS* Reuter, 1910

19. Antennae very dense, short and adpressed pubescent with a few intermixed bristles; second segment incrassate towards the apex were it is thicker than first; body with short, stout, erect, black bristles (Togo) .... *CHAETOCAPSUS* Poppius, 1914

— Antennae with a single type of pubescence; body without short, stout, erect black bristles 20

20. Pronotum strongly constricted and narrowed on anterior half; posterior femora incrassate apically, posterior tibiae curved in-

ternally (fig. 241) (Madagascar) ....
.... *MALGACHEOCORIS* Carvalho, 1952

— Pronotum not as above, femora not noticeably incrassate at apex 21

21. Frons projecting in front into a tubercular conical process covering part of the laminate (strongly compressed) clypeus; length of projection about equal to thickness of first antennal segment (fig. 236) (Africa) ....
.... *ACRORRHINIUM* Noualhier, 1895

— Frons rounded, flat or convex, without a tubercular conical projection 22

22. Antennae inserted about the middle of eyes (Africa) ....
.... *PANGANIA* Poppius, 1914

— Antennae inserted bellow or about the inferior third or level with apex of eye 23

23. Scutellum short and narrow, with a pit shapped depression at base, behind the impression somewhat swollen; females brachypterous with elytra sharp and transversely flattened at base; head as wide as base of pronotum, both dull, the hemielytra strongly shining (Madagascar) ....
.... *MYRMICOPSELLA* Poppius, 1914

— Scutellum without a pit like depression at base 24

24. Genae higher than width of one eye; head distinctly ant like, with a raised carina in front of apex of eye (Europe) ......
.... *MIRMICOMIMUS* Reuter, 1881

— Genae much ess high than width of one eye; apex of the latter not continued by a carina, head not noticeably modified 25

25. Hemielytra with longitudinal oblique white lines or fascia; large species about 5 mm long or more 26

— Hemielytra without longitudinal oblique whitish lines or fascia; species much smaller in size 27

26. Second antennal segment linear; pronotum strongly narrowed in front (North America) ....
.... *CLOSTEROCORIS* Uhler, 1890

— Second antennal segment incrassate towards the apex; pronotum not noticeably narrowed in front (Europe) ....
.... *CREMNOCEPHALUS* Fieber, 1861

27. Vertex marginate or carinate, sometimes angulate posteriorly, pronotum strongly convex on disc and declivous 28

— Vertex not marginate or carinate; pronotum not noticeably declivous 28

28. Head very large, as wide as with of pronotum at base; eyes Occupying the whole sides of head, reaching the gula below (Pemba Is.) .... *BOOPIDELLA* Reuter, 1907
— Head not very large, narrower than width of pronotum at base; eyes not reaching the gula below 29
29. Collar very wide, equally leveled and arched with pronotum, very slightly depressed, separate from disc by a faint line; pronotum long, narrow, the sides strongly rounded (Africa) .... *DIOCORIS* Kirkaldy, 1902
— Collar distinctly set off and depressed, sides of pronotum not noticeably rounded 30
30. Body with very long erect pubescence intermixed with short, adpressed silvery wooly hairs; hind tibiae fairly thick, with very long and slender spines (Africa) .... *TRICHOPHTHALMOCAPSUS* Poppius, 1914
— Body with a single type of pubescence; hind tibiae if thick then the spines not very long and slender 31
31. Head seen from front distinctly longer than wide, gula long, horizontal upper lip large, cell of membrane with right or straight apical angle (Africa) .... *SYSTELLONOTIDEA* Popius, 1914
— Head seen from front not or slightly longer, usually shorter than wide; gula short, if long not horizontal, upper lip small, apical angle of membrane rounded 32
32. Tibiae with spines at least apically 33
— Tibiae without spines (North Africa) .... *GLAPHYROCORIS* Reuter, 1903
33. Eyes large, elongate, distinctly produced beyond sides of collar; head strongly inclined, flat anteriorly (Europe, North Africa) .... *MIMOCORIS* Scott, 1872
— Eyes small, rounded, not noticeably produced outwards; head not strongly inclined, frons rounded 34
24. Scutellum strongly tumid (male) or with a spine like process (female); pronotum very strongly declivous 35
— Scutellum flat or convex on both sexes; pronotum not strongly declivous (Europe, Africa, India) .... *HALLODAPUS* Fieber, 1860
35. Third and fourth antennal segment thicker than second; scutellum with a spiniform protuberance (Africa) .... *HYPOMIMUS* Lindberg, 1940
— Third and fourth antennal segments more slender than second; scutellar protuberance blunt (Europe, Asia, Africa, Java) ... . *LAEMOCORIS* Reuter, 1879

36. Dorsum pubescent 37
— Dorsum glabrous or only very scanty pubescent 39
37. Pubescence very short, dense and adpressed (North Africa) ... . *FORMICOPSELLA* Poppius, 1914
— Pubescence erect, semierect, not noticeably short 38
38. Eyes contiguous with pronotum (Africa) .... *SYSTELLONOTOPSIS* Poppius, 1914
— Eyes removed from pronotum (Europe, Asia, Africa) .... *SYSTELLONOTUS* Fieber, 1858
39. Clypeus prominent, visible from above; head as wide as width of base of pronotum (Europe, Asia, Africa) .... *OMPHALONOTUS* Reuter, 1876
— Clypeus not noticeably prominent and visible from above; head not as wide as base of pronotum (Madagascar) .... *LISSOCAPSUS* Bergroth, 1903

NOTE: The genus *Trachelonotus* Reuter, 1904 (Ann. Mus. Zool. St. Petersb. 9:8) from Persia is not included in the key. *Mimocapsus* Wagner (Egypt) runs in this key with *Glaphyrocoris* Reuter and *Mimocoris* Scott.

KEY TO THE GENERA OF *HALTICINI*

1. Frons very prominent, rounded and convex; posterior femur very thick, its largest diameter about equal to width of one elytra; both sexes brachypterous; small species with reddish marks (Hawaii) ...... *NESIDIORCHESTES* Kirkaldy, 1902
— Frons not noticeably prominent; femora not as thick as width of elytra; if both sexes brachypterous, reddish marks absent fig. 240) 2
2. Antennae very long and slender, second segment four or more times as long as first segment; brachypterous forms common, with oval body, strongly convex (fig. 240) 3
— Antennae shorter, second segment little more than three times as long as first segment or much shorter 4
3. Eyes removed from anterior margin of pronotum; vertex straight posteriorly, head seen from front pentagonal (China) .... *ECTOMETOPTERUS* Reuter, 1906
— Eyes contiguous with pronotum; vertex somewhat arcuate posteriorly; head seen from front not pentagonal (fig. 240) (Cosmopolitan) .... *HALTICUS* Hahn, 1832
4. Eyes distinctly pedunculate, the vertex very wide (fig. 170) 5
— Eyes not pedunculate, sometimes substylate 6

5. Pronotum rugulose punctate, vertex carinate, the carina arcuate; rostrum reaching base of middle coxae (North America) .... *LABOPELLA* Knight, 1929

— Pronotum not punctate; vertex without an arcuate carina; rostrum reaching apex of middle coxae or beyond (fig. 170) (Europe, Asia, North America) ...... *LABOPS* Burmeister, 1835

6. Body glabrous, distinctly punctured; both sexes brachypterous, first antennal segment with stout black bristles and short pubescence (Europe, Asia) .... *EURYOPICORIS* Reuter, 1875

— Body not glabrous and punctate, if so, then one sex macropterous and first antennal segment with a single type of pubescence 7

7. Body, especially head and pronotum, with long stiff black bristles; length of hairs of third antennal segment usually more than twice as great as thickness of segment 8

— Body without long stiff black bristles; antennae with much shorter pubescence 17

8. Both sexes brachypterous; elytra with whitish flattened or scale-like pubescence amongst the bristles 9

— Males macropterous, females brachypterous; hemielytra without flattened or scale-like whitish pubescence or if so, no bristles present but only adpressed pubescence 12

9. First antennal segment with very short bristles and scale-like pubescence; femora with many thick and stout bristles (Europe, Asia) .... *ANAPUS* Stal, 1858

— First antennal segment with bristles and common pubescence; femora with only a few or without stout and thick bristles 10

10. Hemielytra not reaching beyond the second abdominal segment; hind femora with numerous fine bristles 11

— Hemielytra reaching beyond second abdominal segment; hind femora with a single seta (Asia) .... *PLATYPORUS* Reuter, 1900

11. Hind femora with only one type of long and fine bristles; body with dense whitish flattened pubescence and bristles (Turkestan) .... *SCIRTETELLUS* Reuter, 1891

— Hind femora with a few long bristles mixed with very short ones; body with very scanty silky pubescence and common bristles (Spain) .... *HOMOEOCORIS* Fuente, 1918

12. Pubescence of body composed of flat whitish scale-like hairs mixed with hairs or bristles; second antennal segment about as thick as first 13

— Pubescence of body composed of one type only, or silky or woolly mixed with common hairs; second antennal segment slender than first 14

13. Antennae with very short pubescence; vertex somewhat curved posteriorly; rostrum reaching middle of abdomen (North Africa) .... *ORANIELLA* Reuter, 1894

— Antennae with bristles and hairs; vertex straight posteriorly; rostrum shorter (Europe, Asia, N. Africa, U.S.A.) .... *ORTHOCEPHALUS* Fieber, 1858

14. Hemielytra with single type of semi-adpressed hairy pubescence; head as wide as base of pronotum (Europe, Asia, N. Africa) .... *PACHYTOMELLA* Reuter, 1890

— Hemielytra with silky hairs mixed with common ones; head narrower than base of pronotum 15

15. Males with cuneus more than three times as long as wide; membrane and areolae elongate; eyes substylate (Europe, Asia, Africa) .... *DIMORPHOCORIS* Reuter, 1891

— Males with cuneus about twice as long as wide; eyes not substylate 16

16. Small black species; rostrum reaching apex of posterior coxae (males) (Europe) .... *SCHOENOCORIS* Reuter, 1891

— Medium size greenish species; rostrum not reaching beyond apex of middle coxae (males) (Europe, Asia, N. Africa) .... *PLAGIOTYLUS* Scott, 1874

17. Male with vertex strongly carinate and depressed, frons separate from clypeus by a semicircular ridge: rostrum not reaching middle of mesosternum: females brachypterous, piceous bluish, punctate (fig. 83))Europa, Asia) .... *PIEZOCRANUM* Horvath, 1877

— Male with vertex and frons not as above; rostrum longer, reaching middle coxae or beyond; females macropterous 18

18. Body distinctly punctate; head not produced in middle of antennal bases; cuneal fracture not deep and wide 19

— Body smooth; head produced in middle of antennal bases; small species with deciduous pubescence; cuneal fracture wide and deep (India) .... *STHENARIDEA* Reuter, 1884

19. Embolium widened toward the apex; body with erect pubescence; second antennal segment about twice as long as head; females with hemielytra enlarged apically (India) .... *ACRATHEUS* Distant, 1910

— Embolium narrowed toward the apex; body glabrous or with semi-adpressed pubescence; second antennal segment shorter or slightly longer than head; females with hemielytra not enlarged

apically (Europe, Asia, N. Africa, and N. America) .... *STRONGYLOCORIS* Blanchard, 1840

NOTE: The genus *DASYSCYTUS* Fieber, 1864 (Wien. Ent. Monat. 8:84) from Spain, is not included in Key, as well as *HALTICIDEA* Reuter, 1901 (Ofv. F. Vet. Soc. Förh. 43:172), Russia; and *SARONA* Kirkaldy, 1902 (Fauna Haw. *3* (2):142), Hawaii.

KEY TO THE GENERA OF *ORTHOTYLINI*

1. Second, third and fourth segments of antennae incrassate, about equal in thickness (fig. 102) 2
— Second segment of antennae thicker than third or fourth (fig. 103) 3
2. Pronotum anterior to middle nearly cylindrical, rather abruptly flaring behind middle, basal half of disc strongly convex; emboliar margins sulcate on basal half (North America) .... *PAMILIA* Uhler, 1887
— Pronotum regularly narrowed anteriorly, its sides not constricted at middle; emboliar margins not sulcate (North and South America) .... *CERATOCAPSUS* Reuter, 1875
3. Scutellum elevated and swollen, curving cystiformly forward over the disc of pronotum, biconstricted, with a small erect dorsal spine in front of the anterior constriction (fig. 257) (Australia) .... *CYSTEORRACHIA* Kirkaldy, 1907
— Scutellum not as above 4
4. Pronotum distinctly punctate, if punctures are obscured by rugosities then hemielytra punctate (fig. 74) 5
— Pronotum smooth or rugose 14
5. Hemielytra without an apparent cuneus; small cell of membrane faintly delineate or not visible (Hawaii) .... *SULAMITA* Kirkaldy, 1902
— Hemielytra with a distinct cuneus and small cell of membrane 6
6. Small species with head as wide as pronotum at base; frons striolate finely punctured; antennae very short; margins of pronotum carinate, a pseudocollar present (Australia) .... *CORIDROMIUS* Signoret, 1862
— Frons not punctate or striolate; pronotum not carinate laterally 7
7. Clypeus strongly prominent; eyes seen from front flattened and somewhat pedunculate; scutellum strongly prominent, raised at middle; body with short and dense adpressed pubescence (Hawaii) .... *KALANIA* Kirkaldy, 1904

— Clypeus not noticeably prominent; eyes seen from front not pedunculate; scutellum flat or convex, not raised at middle; body pubescence not noticeably short, dense and adpressed 8

8. Dorsum thickly clothed with semidecumbent pubescence; vertex strongly declivous anteriorly, carinate; colour back (North America) .... *LOPIDELLA* Knight, 1925

— Dorsum with erect pubescence or almost glabrous; vertex not as above 9

9. Hemielytra smooth, transparent; calli with two deep fossae behind them; body with fine, long and erect pubescence (Brazil) .... *SOLANOCORIS* Carvalho, 1945

— Hemielytra punctate; calli without two fossae behind them; body without long, fine and erect pubescence 10

10. First and second antennal segments very thick, the second segment flattened, third and fourth segments very short and slender (Africa) .... *MILLERIMIRIS* Carvalho, 1951

— First and second antennal segments linear and not noticeably thick 11

11. Dorsal surface evenly punctured, a pubescent hair arising from each puncture 12

— Dorsal surface punctured but without a pubescent hair arising from each puncture 13

12. Cuneus very small, wider at base than long; second antennal segment incrassate towards the apex; rostrum reaching the posterior coxae (Samoa) ....
.... *PSEUDONEOBORUS* Knight, 1935

— Cuneus about twice as long as wide at base; second antennal segment linear; rostrum reaching the middle coxae (Africa)
.... *BUNSUA* Carvalho, 1951

13. Hemielytra distinctly rounded laterally; eyes rounded, somewhat removed from pronotum (Venezuela) ....
.... *FALCONIODES* Reuter, 1905

— Hemielytra more or less straight laterally; eyes straight posteriorly, contiguous with pronotum (fig. 108) (Central & South America) .... *FALCONIA* Distant, 1884

14. First and second antennal segments conspicuous, the second strongly enlarged, compressed or foliaceus; third and fourth very short and slender; black species (figs. 111, 230) 15

— First and second antennal segments not noticeably modified, or if so, then second not foliaceus 18

15. First and second antennal segments with flattened hairs; frons produced between antennae (Europe) ....
.... *HETEROTOMA* Lepeletier & Serville, 1825

— First and second antennal segments without flattened hairs; frons not produced (fig. 230) 16

16\. Membrane apically acutely pointed (Tunisia) .... *ACRODERRHIS* Bergroth, 1914

— Membrane not acutely pointed at apex 17

17\. Vertex carinate; rostrum reaching base of middle coxae (Africa, Ceylon) .... *DRUTHMARUS* Distant, 1909

— Vertex not carinate; rostrum reaching base of abdomen (fig. 111) (Europe, Asia, South America) .... *EXCENTRICUS* Reuter, 1878

18\. Pronotum with pleural area separated from dorsal part by a distinct suture, pronotal disc raised posteriorly and projecting above scutellum, clothed with dense, bristly pubescence (fig. 106) (North America) .... *SEMIUM* Reuter, 1875

— Pronotum without a distinct lateral suture and not projecting posteriorly over scutellum 19

19\. Body with distinct scale-like or flattened pubescence intermixed with hairs or bristles or densely covered with whitish flattened somewhat scale-like hairs specially on underside 20

— Body clothed with a single type of pubescence or sometimes intermixed with silky hairs 32

20\. Head without a well defined posterior margin 21

— Head with a well defined posterior margin 23

21\. Head rounded in front, second antennal segment incrassate towards the apex; pronotum constricted anteriorly with raised calli; dark species with pale areas; antmimic (Europe, Asia, North America) .. *GLOBICEPS* Le Pelletier & Serville, 1825

— Head not rounded in front, second antennal segment cylindrical; pronotum if constricted anteriorly then calli not raised; species usually with greenish color or if dark then not antmimic 22

22\. Head noticeably produced in front; clypeus very large and prominent; species usually over 4 mm. long with normal femora (North America) .. ARGYROCORIS Van Duzee, 1912

— Head not noticeably produced in front; clypeus not as above; species usually less than 4 mm. long, with enlarged posterior femora (North America) .... *PARTHENICUS* Reuter, 1876

23\. Tibiae with black spots at base of spines; body covered by very dense whitish flattened hairs on the underside 24

— Tibiae without black spots at base of spines; underside of body with common pubescence 25

24. Femora with black spots or if not then color greenish; eyes rounded (North America) .... *PSEUDOPSALLUS* Van Duzee, 1916

— Femora without spots; general color black; eyes strongly compressed (Europe) .... *HYPSELOECUS* Reuter, 1891

25. Second antennal segment thickened at apex or if not, then very black species (fig. 104) (Europe, Asia, North America) .... *HETEROCORDYLUS* Fieber, 1858

— Second antennal segment linear or so; never very black species 26

26. Cuneus rounded externally, cuneal incisure deep; pronotum carinate laterally; reddish species (Seychelles Is.) .... *MARALAUDA* Distant, 1913

— Cuneus not as above (except brachypterous forms); pronotum not carinate 27

27. Claws deeply cleft with inner half wider; head inclined and distinctly produced before bases of antennae (North America) .... *BIFIDUNGULUS* Knight, 1930

— Claws not divided, head not noticeably produced in front 28

28. Vertex very wide; first antennal segment about equal to half width of vertex; bristle like pubescence very fine and erect; females brachypterous or almost so (North America) .... *LABOPIDEA* Uhler, 1877

— Vertex not noticeably wide; first antennal segment distinctly longer than half the width of vertex; bristle like pubescence short; females macropterous 29

29. Rostrum short, scarcely attaining hind margin of mesosternum; large, elongate fuscous species 5 to 6 mm. long (North America) .... *NOCTUOCORIS* Knight, 1923

— Rostrum reaching the middle coxae or beyond; species usually greenish in color 30

30. First antennal segment shorter than width of vertex; scale-like pubescence usually silvery (Europe, North America) .... *MELANOTRICHUS* Reuter, 1875

— First antennal segment as long as or longer than width of vertex; scale-like pubescence mostly but not necessarily black 31

31. Rostrum reaching far beyond apices of hind coxae; clypeus very large, usually, wider than thickness of first antennal segment (North America) .... *MACROTYLOIDES* Van Duzee, 1916

— Rostrum not reaching beyond hind coxae; clypeus not large, usually as wide as or narrower than first antennal segment 32

32. Bristles black with or silvery scales between; pronotum without blac scale-like spots; first antennal segment much longer than width of vertex (North America) .... *ILNACORELLA* Knight, 1925
— Bristles light with black scales between; pronotum with black scale-like spots; first antennal segment about as long as width of vertex (North & Central America) .... *ILNACORA* Reuter, 1876

33. First antennal segment very thick, about as long as head and pronotum together; cuneus about four times as long as wide at base, somewhat curved outwards externally (fig. 228) (Africa) .... *UELEANA* Carvalho, 1951
— First antennal segment if long, not noticeably thick; cuneus not as above 34

34. Eyes rounded behind and set in front, at or near middle of head, usually well removed from anterior margin of pronotum by a space equal at least to thickness of first antennal segment, long cuneus (figs. 114, 155) 35
— Eyes relatively straight behind, contiguous or set very close to anterior margin of pronotum (figs. 117, 118) 54

35. Vertex depressed at middle; areolae of membrane sclerotized as cuneus, apparently with a simple cell; male with a conspicuous antenna (first and second segments with two long spines, the second also with a medium fossa surrounded by small dark spines) as in fig. 00 (North, Central & South America) .... *HYALOCHLORIA* Reuter, 1907
— Vertex convex; areolae not chitinized or if so with two distinct cells; male antennae not as above 36

36. First antennal segment shorter or about as long as width of vertex; if not, then cuneus 2 times or more as long as wide at base 37
— First antennal segment distinctly longer than width of vertex, usually as long as or longer than width of head with eyes 46

37. Calli with two deep furrows behind them containing punctures; head with a short neck; eyes removed from pronotum by a distance equal to more than half the legth of one eye (Jamaica) .... *MESOTROPIS* Reuter, 1907
— Calli without two deep furrows with punctures behind them; head withouth a short neck 38

38. Head very flat, wider or about as wide as pronotum at base, clothed with silky silvery pubescence; pronotum rectangular (fig. 107) 39
— Head not very flat, if wider than pronotum at base, then without silky pubescence 40

39. Internal margin of eye straight; rostrum reaching apex of middle coxae (Australia) ...... *COMPSOSCYTUS* Reuter, 1909
— Internal margin of eye strongly divergent; rostrum reaching slightly beyond anterior coxae (fig. 107) (Europe, North Africa) .... *PLATYCRANUS* Fieber, 1870
40. Head with a short neck; eyes situated more towards anterior end of head; body fairly long and erectly pilose (fig. 155) 41
— Head without a short neck; eyes situated more towards base of head; body not long and erectly pilose (fig. 110) 42
41. Clypeus seen from above; eyes very small, head elongate; first antennal segment with a black fascia inferiorly (Europe. North Africa, North America) ...... *MALACOCORIS* Fieber, 1858
— Clypeus not seen from above; eyes not very small, head rounedd (fig. 155) (India, Formosa, Ceylon) .... *ZANCHIUS* Ditsant, 1901
42. First segment of antennae with a longitudinal black line on either side, these lines connected on ventral side near apex (Europe, North America) .... *REUTERIA* Puton, 1875
— First segment of antennae not marked with longitudinal black lines as above 43
43. Elongate slender species; cuneus twice or more as long as wide at base 44
— Species if elongate, cuneus shorter 45
44. Eyes small, placed at middle of head, usually distant from pronotum by more than diameter of first antenna; if this distance equals diameter of segment (male) then hemielytra reaching far beyond tip of abdomen (Americas) .... *PARAPROBA* Distant, 1883
— Eyes large, placed on posterior portion of head, usually not more removed from pronotum then thickness of forst antenna; if this distance equals diameter of segment (male) then hemelytra not as above (fig. 203) (North America) .... *DIAPHNIDIA* Uhler, 1895
45. Second antennal segment about as thicks as the first; membrane cells membranous (Central & South America, Jamaica) .. .. *SAILERIA* Hsiao, 1945
— Second antennal segment distinctly more slender than the first; membrane cells coriaceus (Central & North America) .... *PLATYSCYTUS* Reuter, 1907
46. Rostrum reaching the middle of the abdomen or beyond .. 47
— Rostrum not reaching beyond the posterior coxae 50

47. Pronotum strongly constricted anteriorly; clavus with a row of punctures; cuneus almost four times as long as wide at base (Madagascar) ...... *MADAGASCARIELLA* Carvalho, 1953

— Pronotum not strongly constricted anteriorly; clavus without a row of punctures; cuneus shorter 48

48. Vertex with a straight carina postealiorly, the eyes blutnly margined behind; body with esparse, long, erect and fine pubescence (fig. 115) (Central & South America) .... *JOBERTUS* Distant, 1884

— Vertex without a straight carina behind or if so, eyes not margined posteriorly; body not noticeably long pilose (fig. 110) 49

49. Pronotum bisinuate posteriorly; eyes distant from pronotum by an espace equal to thickness of first antennal segment (fig. 110) (Brazil) .... *BRASILIOMIRIS* Carvalho, 1946

— Pronotum straigth posteriorly; eyes situated in front of the middle of head (fig. 114) (Brazil) .... *ITACORIS* Carvalho, 1947

50. Pronotum strongly constricted at middle; claval vein with a row of punctures; species noticeably elongate and slender with transparent hemielytra (Africa) .... *FELISACODES* Bergroth, 1926

— Pronotum not strongly constricted; claval vein without punctures 51

51. Upper lip very thick, inflated, dense and shortly pubescent; first antennal segment about twice as long as the head (Canary Is.) .... *AETORRHINELLA* Nonalhier, 1893

— Upper lip not inflatted or pubescent; first antennal equal or slightly longer than the head 52

52. First segment of antennae longer than head seen from above; rostrum reaching slightly beyond posterior coxae; eyes small (Central America) .... *PARACHIUS* Distant, 1881

— First antennal segmen t as long as head seen from above; rostrum reaching the posterior coxae; eyes large 53

53. Head strongly narrowed behind the eyes; pronotum with two sublateral furrows reaching posterior margin of calli (Formosa) .... *ZONODOROPSIS* Poppius, 1915

— Head not strongly narrowed behind the eyes; pronotum withoutr the two furrows above (Jamaica) .... *MELANOSTICTUS* Reuter, 1907

54. A well defined oblique suture on gena extending from antennal fossa to beneath eye, this suture (fig. 234) frequently outlined

by a dark stripe; red orange and black species (Nort and Central America) .... *LOPIDEA* Uhler, 1872

— Genal suture absent or extending directly from antennal fossae to eyes or present, but vague and not outlined by a dark stripe 55

55. Pronotum strongly declivous, clypeus oblique, situated beneath head; eyes very large; body with silky pubescence; rostrum reaching slightly beyond anterior coxae (fig. 212) (Argentina) .... *HYPORRHINOCORIS* Reuter, 1909

— Pronotum not strongly declivous, clypeus vertical, situated in front of head; eyes not very large, body with other type of pubescence or if silky, then rostrum longer 56

56. Species mormorate (as in *Phytocoris*); rostrum reaching middle of abdomen; posterior femora flattened (also as in *Phytocoris*); abdomen long and erectly pilose (Hawaii) .... *KAMEHAMEHA* Kirkaldy, 1902

— Species not marmorate or if so, rostrum shorter and posterior femora not flattened; abdomen not noticeably long pilose 57

57. Head strongly produced in front of eyes, this space being about twice as long as length of eyes; antennae inserted for from the eye, the space between them equal to or slightly over the thickness of first segment; head somewhat horizontal, body glabrous (Hawaii) ..... *PSEUDOCLERADA* Kirkaldy, 1902

— Head not as above, antennae inserted much closer to the eye; head vertical or strongly inclined 58

58. Small pale species with both sexes usually brachypterous; membrane and cuneus absent; pronotum trapeziform (Europe) ... . *FIEBEROCAPSUS* Carvalho & Southwood, 1955

— Species macropterous or if one sex brachypterous, then cuneus or membrane present; pronotum not as above 59

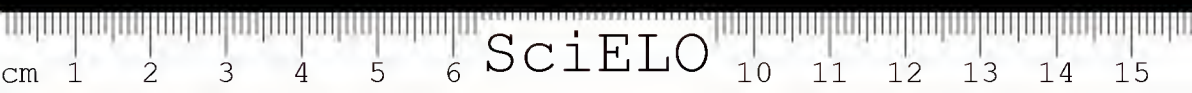
59. Vertex with a distinct raised carina at posterior margin (fig. 112) 60

— Vertex without a distinct raised carina at posterior margin fig. 36) 77

60. Carina extending from eye to eye and bearing erect bristles (fig. 259) 61

— Carina if extending from eye to eye without stout black bristles or erect setae (bristles may be present on vertex) 65

61. First antennae about as long as width of haed including eyes; greenish coloured species (Europe, Asia, North Africa) .... *BLEPHARIDOPTERUS* Kolenati, 1945

— First antennae shorter than or as long as width of vertex 62

62. Pronotum distinctly narrowed and constricted in front, calli prominent; species with antmimic colouration (Europe) .... *DRYOPHILOCORIS* Reuter, 1875

— Pronotum not noticeably constricted in front; species without antmimic colouration 63

63. Reddish or yellow but reddish marked species; body noticeably long ant erectly pilose; hemielytra dull, not transparent 64

— Otherwise colored, sometimes with traces of brick reddish, if long, fine and erectly pilose, then the hemielytra transparent 65

64. Frons somewhat protruding between bases of antennae, which has bristles and some erect setae (Europe, Asia, India) .... *PSEUDOLOXOPS* Kirkaldy, 1905

— Frons not protruting between bases of antennae which has bristles only (Ceylon) .... *THERMUS* Distant, 1909

65. Hemielytra glassy, transparent, long, esparse and erectly setose; pronotum strongly curved posteriorly ,fig. 109) (South America) .... *PLINIELLA* Bergroth, 1922

— Hemielytra not glassy or transparent; pronotum not strongly curved posteriorly 66

66. Green to yellowish species; pronotum not carinate laterally (North America) .... *LABOPIDEA* Uhler, 1877

— Dark species, sometimes with traces of reddish; pronotum carinate laterally 67

67. Pronotum flattened laterally with the sides strongly carinate; bristly pubescence very long (Mexico) .... *HADRONEMIDEA* Reuter, 1909

— Pronotum not flattened laterally only slightly carinate; bristly pubescence fairly short (fig. 112) (North America) .... *HADRONEMA* Uhler, 1871

68. Vertex with a shallow longitudinal sulcus; head horizontal; an S-shaped smooth ridge bent forward arising from the peritreme present (Formosa) .. *ZONODORELLUS* Poppius, 1915

— Vertex not longitudinally sulcate; an Sshaped ridge arising from peritreme absent 69

69. Rostrum reaching the apex of anterior coxae; cuneus about as long as wide at base 70

— Rostrum reaching the middle of mesosternum or beyond; cuneus usually longer than wide 71

70. Hemielytra glabrous, shining; pronotum smooth (Central & South America) .... *JORNANDES* Distant, 1881

— Hemielytra pubescent; pronotum somewhat rugose (Hawaii) .... *KOANOA* Kirkaldy, 1902

71. Frons and vertex strongly declivous, the latter somewhat depressed, carina high with sharp edge; body shagrine, almost glabrous; membrane noticeably long (Mexico) .... *FICINUS* Distant, 1893

— Frons and vertex not as above or if so, the carina low and blunt; body not shagrine and membrane not noticeably long 72

72. Vertex with a black fossa each side next to the eye; with striated black marks on frons (Europe, North Africa) .... *HYOIDEA* Reuter, 1876

— Vertex and frons without the above marks 73

73. Head strongly declivous, pointed below; eyes contiguous with pronotal angles; first antennal segment about as long as half the width of vertex 74

— Head not strongly declivous; eyes slightly removed from pronotal angles; first antennal segment about as long as vertex 75

74. Arolia large, broadned toward the apex which is truncate (fig. 69); species olivaceous in color (Malay) .... *PARASTHENARIDEA* Miller, 1937

— Arolia small, tapering toward the apex which is pointed; species usually black to rufescent (Micronesia, Philippines, S. America, Puerto Rico) .... *ORTHOTYLELLUS* Knight, 1935

75. Carina of vertex arcuate posteriorly; species over 7 mm. long, with resemblance to *Cyllecoris* and *Globiceps* (Korea) .... *CAMPYLOTROPIS* Reuter, 1904

— Carina of vertex not arcuate posteriorly; species less than 7 mm. long, without resemblance to the genera above mentioned 76

76. Second antennal segment about three times as long as third; genital segment of males with a median projection directed backwardly (Canary Is.) .. *CANARIOCORIS* Lindberg, 1951

— Second antennal segment about twice or less as long as third; genital segment of males without a ventral projection directed backwards (Europe, North America, Africa) .... *ORTHOTYLUS* Fieber, 1858

77. Rostrum reaching apex of anterior coxae or slightly beyond 78

— Rostrum reaching beyond middle of mesosternum 79

78. Pronotum not noticeably narrowed anteriorly; second segment of antenna linear; slender, elongate greenish species (Europe) .... *BRACHYNOTOCORIS* Reuter, 1890

— Pronotum narrowed anteriorly; second antennal segment slightly incrassate; species black and rufescent (Central America) .... *RHINOCAPSIDEA* Reuter, 1908

79. Clypeus strongly compressed and prominent, roundish in front, seen from above distinctly produced between antennae; body with long erect and esparse bristles (fig. 154) (South America) .... *CYRTOTYLUS* Gergroth, 1922

— Clypeus not as above or if so, the body without long erect and esparse bristles 80

80. Body with silvery silky pubescence intermixed with fine erect hairs; tibiae with long spines having dark spots at base (Africa, Central & South America) .... *ELLENIA* Remer, 1940

— Body with a single type of pubescence 81

81. First antennal segment shorter than width of vertex; eyes contiguous with anterior margin of pronotum 82

— First antennal segment longer than width of vertex or if not then eyes somewhat removed from anterior margin of pronotum 83

82. Head pointed in front; body fairly pilose; vertex smooth; second antennal segment less than 5 times longer than first segment (Greece) .... *AMIXIA* Reuter, 1883

— Head not jointed in front; body covered with short hairs; vertex longitudinally sulcate; second antennal segment 5 times longer than first segment (India) .. *ASERYMUS* Distant, 1904

83. Pronotum noticeably narrowed in front, constricted, calli prominent; species with antmimic colouration; female antennal segment clavate (Europe, Asia) ....
.... *CYLLECORIS* Hahn, 1834

— Pronotum not noticeably constricted and narrowed in front; calli not prominent; species without antmimic colouration 84

84. Eyes contignous with anterior margin of pronotum; rostrum reaching apex of mesosternum (Europe) ....
.... *PACHYLOPS* Fieber, 1858

— Eyes slightly removed from pronotum; rostrum reaching middle of posterior coxae 85

85. Rostrum reaching the middle coxae; pronotum with a slender anterior collar (Europe, Asia, North Africa, North America)
.... *MECOMMA* Fieber, 1858

— Rostrum reaching the posterior coxae; pronotum without an anterior collar (Cosmopolitan) ....
.... *CYRTORHINUS* Fieber, 1858

KEY TO THE GENERA OF *PILOPHORINI*

1. Frons with a spiniform projection bent downwards over base of clypeus which is compressed; first rostral segment not reaching base of head; pronotum and abdomen very strongly constricted; species extremely myrmicomorphic (Ceylon) .... *LUTHERIELLA* Poppius, 1913
— Frons without a spiniform projection 2
2. Scutellum with an erect spiniform process (fig. 213) 3
— Scutellum flat or convex, without a spiniform process 5
3. Pronotum dense and finely punctured (Africa) .... *OPYSTOCYCLUS* Poppius, 1914
— Pronotum not punctured 4
4. Second antennal segment abouth as the thick as third (North America) .... *CYRTOPELTOCORIS* Reuter, 1875
— Second antennal segment distinctly thicker than third (Argentine) .... *MYRMECOZELOTES* Berg, 1884
5. Head much higher than long or wide; eyes substylate rising distinctly above level of vertex; antennae inserted far from eye, this distance being about equal the eight of eye; both sexes brachypterous (Europe, Asia) .... *MYRMECOPHYES* Fieber, 1870
— Head not as above; eyes not substylate; antennae inserted nearer to the eyes 6
6. Anterior coxae with a strong tubercle at base; pronotum strongly constricted and narrowed on anterior third, the sides carinate anteriorly (Madagascar) .... *EUCOMPSELLA* Poppius, 1914
— Anterior coxae without a strong tubercle at base; pronotum if constricted not carinate anteriorly 7
7. Gula strongly carinate; upper lip as long and wide as first rostral segment; head (vertex and frons) very depressed, sunk bellow eye level (fig. 80) (Chile) .... *DOLICHOSTENIA* Poppius, 1921
— Gula not strongly carinate; upper lip smaller, not as wide as first rostral segment; head convex or flat, not noticeably depressed on vertex 8
8. Pronotum strong and transversely rugose; rostrum reaching apex of middle coxae (Australia) .... *KIRKALDIELLA* Poppius, 1921
— Pronotum not rugose or only slightly so 9

9. Second antennal segment as thick as third, or fourth; females usually brachypterous or with modified hemielytra (short membrane) (fig. 102) 10
— Second antennal segment thicker than third and fourth; females usually macropterous (fig. 103) 19
10. Vertex strongly carinate, the carina as high as thickness of second antennal segment at base; scutellum strongly tumid; frons striolate; hemielytra with somewhat rugose surface (Africa) .... *NICHOMACHUS* Distant, 1904
— Vertex carinate not as above; scutellum not noticeably tumid; frons not striolate 11
11. Hemielytra with scale like hairs or transversal silvery scale like pubescent bands 12
— Hemielytra without scale like hairs or silvery bands 14
12. Hemielytra with long erect bristles and scale like hairs; pronotum not strongly narrowed in front 13
— Hemielytra with semiadpressed pubescence plus scale like hairs; pronotum strongly narrowed in front (Bolivia) .... *LEPIDOTAENIA* Poppius, 1921
13. Pronotum covering mesoscutum and part of scutellum (Central & North America) .... *RENODAEUS* Distant, 1893
— Pronotum not covering mesoscutum (North America) .... *PILOPHOROPSIS* Poppius, 1914
14. Pronotum noticeably constricted at middle; tibiae usually somewhat curved; only females known 15
— Pronotum not noticeably constricted at middle; tibiae straight; males known 26
15. Anterior portion of pronotum with two or three tubercles, erect and pointed (Venezuela) .... *ZANCHISME* Kirkaldy, 1904
— Anterior portion of pronotum without tubercles 16
16. Pronotum not deeply constricted at middle, finely punctate, shining; hemielytra covering the abdomen (India) .... *ZARATUS* Distant, 1909
— Pronotum deeply constricted at middle, smooth or if punctate, the hemielytra not reaching apex of abdomen 17
17. Hemielytra distinctly punctate at base, reaching beyond the posterior coxae (Africa) ...... *LASIOMIMUS* Poppius, 1914
— Hemielytra smooth, not reaching beyond the posterior coxae 18
18. Posterior lobe of pronotum conically produced upwards; eyes elongate and oblique on head (North Africa) .... *FORMICOCORIS* Lindberg, 1940

— Posterior lobe of pronotum not conically produced upwards; eyes rounded (Australia) .. *MYRMECORIDEA* Poppius, 1921

19. Vertex not compressed posteriorly, neither overlapping anterior edge of pronotum 20

— Vertex noticeably compressed and carinate posteriorly, usually overlapping slightly anterior edge of pronotum (fig. 261) 22

20. Length of first antennal segment shorter than width of head; pronotum not constricted anteriorly (Australia) .... *LEUCOPHOROPTERA* Poppius, 1921

— Length of first antennal segment about equal the width of head; pronotum distinctly constricted anteriorly 21

21. Scutellum strongly tumid, elevated; eyes distant from pronotum by an espace greater than the thickness of first antennal segment (North America) .. *CYPHOPELTA* Van Duzee, 1910

— Scutellum convex not noticeably prominent; eyes contiguous with anterior margin of pronotum or so (fig. 262) (North America) .... *PSEUDOXENETUS* Reuter, 1909

22. Hemielytra constricted and recurved ventrad, bearing white or silvery pubescent bands 23

— Hemielytra without white or silvery pubescent bands 24

23. Vertex and frons very flat, faintly sulcate longitudinally; vertex straight posteriorly; membrane long; species noticeably elongate (Chile & Argentina) .... *TUXENELLA* Carvalho, 1952

— Vertex and frons not sulcate longitudinally, rounded or not noticeably depressed; vertex curved posteriorly towards the pronotum; membrane short; species not noticeably elongate (Europe, Asia, Africa, N. America) .... *PILOPHORUS* Westwood, 1876

24. Body almost glabrous; females noticeably dimorphic with head strongly rounded in front and pronotum constricted anteriorly; small species 3 mm long or less (Paraguay) .... *HALLODAPOIDES* Carvalho, 1951

— Body distinctly pubescent; females not strongly dimorphic; species usually over 3 mm long 25

25. Second antennal segment scarcelly thickened towards the apex; width of head equal or larger than base of pronotum (North America) .... *ALEPIDIA* Reuter, 1909

— Second antennal segment incrassate towards the apex; width of head less than width of posterior margin of pronotum (North America) .... *ALEPIDIELLA* Poppius, 1914

26. Pronotum and scutellum finely punctate (Argentina) .... *LAEMOCORIDEA* Poppius, 1921

— Pronotum and scutellum not punctate (Americas) .... *SERICOPHANES* Reuter, 1876

NOTE: The following genera were not included in the key: *Anthropophagiotes* Kirkaldy, 1908 (roc. Linn. Soc. N. S. Wales 33:378) from Fiji.

KEY TO THE GENERA OF *MIRINI*

1. Upper wing without cuneus and membrane, the divisions into corium, clavus and embolium not distinct; second antennal segment long and clavate at apex; brachypterous (Europe, Asia) .... *APHANOSOMA* Costa, 1841
— Upper wing with cuneus and membrane, the divisions into corium, clavus and embolium distinct 2
2. First antennal segment very thick, its diameter being about equal to that of one eye, constricted at middle; second segment strongly incrassate on apical half; third and fourth very short, together subequal to second; clypeus strongly prominent, hemelytra with patches of silvery pubescence (Central America) (fig. 202) .... *EUROTAS* Distant, 1884
— Antennae not as above 3
3. Anterior tibiae strongly enlarged and flattened, foliaceus or so; cuneus about as long as wide at base (Central & South America) .... *HENICOCNEMIS* Stal, 1860
— Anterior tibiae cylindrical, not as above; if enlarged apically then cuneus longer than wide 4
4. Body above smooth, shagrine or rugose, rarely faintly punctulate, is this case, the first segment of hind tarsi very long, about as long as the two last ones together or the lorae strongly carinate (fig. 199) 5
— Body above distinctly punctate (pronotum), the punctures rarely faint, in this case, the surface deeply rugose or with esparse scale-like hairs or silky and silvery pubescence, the head pointed and longly produced 77
5. Lorae very strongly developed and carinate 6
— Lorae if developed, never carinate 7
6. Body long, large and elongate; cuneal incisure small, shallow (Africa) .... *LINOCEROCORIS* Karsch, 1892
— Body fairly small, rounded; cuneal incisure deep (Africa, Fernando Po) .... *LAMPROCAPSIDEA* Poppius, 1912

7. Posterior femora very long, extending much beyond tip of abdomen and flattened, broadest before middle and then tapering gradually to apex or if not flattened, then curved on upper surface 8
— Posterior femora shorter, not or scarcely extending beyond tip of abdomen, not noticeably broad at base 11
8. Pronotum submarginate laterally at apex; head more or less horizontal and pointed; claval vein distinctly raised (Europe, Asia, North Africa) .... *MIRIDIUS* Fieber, 1858
— Pronotum not marginate; head vertical not pointed; claval vein not raised 9
9. Hind femora curved on upper surface, with a few spines on posterior side; pronotum strongly declivous (Java) .... *EUPHYTOCORIS* Poppius, 1914
— Hind femora not curved on upper margin, without spines; pronotum not strongly declivous 10
10. Femora not noticeably narrowed towards apex; calli reaching sides of pronotum; female brachypterous (Asia) .... *PHYTOCORIDEA* Reuter, 1905
— Femora flattened and noticeably narrowed towards the apex; calli not reaching sides of pronotum; females macropterous (Cosmopolitan) .... *PHYTOCORIS* Fallen, 1814
11. First antennal segment thickened, cloted with numerous flattened hairs (fig. 238) (North & Central America) .... *NEUROCOLPUS* Reuter, 1875
— First antennal segment devoid of flattened hairs 12
12. Pronotum with two subexcavated, dull black spots situated behind the callosities (fig. 207) 13
— Pronotum without the spots above or with only superficial ones above the disc 15
13. First antennal segment large, strongly compressed laterally (foliaceus) (fig. 24) (Americas) .... *LAMPETHUSA* Distant, 1881
— First antennal segment cylindrical, not noticeably anlarged 14
14. First antennal segment clothed with long black hairs; vertex convex, frons smooth; rostrum reaching the last coxae (Americas) .... *TAEDIA* Distant, 1883
— First antennal segment clothed with short hairs and two or three setae; vertex depressed, frons striolate; rostrum reaching the 8th abdominal segment (Africa) .... *OXACICORIS* Reuter, 1905

15. Body shagrine and marbled; hemielytra with somewhat scale-like hairs; anterior tibia with an apical tuft of hairs internally (fig. 199) (South America) .. *GUIANELLA* Carvalho, 1946

— Body not shagrine and marbled; if scale-like hairs present then anterior tibia without an apical tuft of hairs 16

16. Second antennal segment at least on males noticeably incrassate towards the apex, somewhat spindle shaped (fig. 197) 17

— Second antennal segment linear or only very slightly incrassate at or towards the apex (fig. 219) 27

17. Head horizontal, clypeus almost reaching apex of first antennal segment; jugum distinctly set off from lorum, frons pointed; first rostral segment reaching only level of middle of eye, which is removed from anterior margin of pronotum; first tibiae enlarged and flattened, body with patches of silvery silky hairs (Africa) .... *TRACHELUCHUS* Bergroth, 1926

— Head not as above or if so, then first tibiae not enlarged and body without patches of silvery silky hairs 18

18. Body with adpressed silvery pubescence; first segment of hind tarsi much longer than second (Australia) .... *PSEUDEURYSTYLUS* Poppius, 1915

— Body without adpressed silvery pubescence or if so, then a second type of hair or bristle present; first segment of hind tarsi not longer than second 19

19. Clavus with two rows of punctures; eyes set at middle of head; antennae and legs very long (Madagascar) .... *ANOSIBEA* Carvalho, 1953

— Clavus without two rows of punctures; eyes closer to collar

20. Pronotum with black setiform bristles intermixed with golden or silvery pubescence: second antennal segment gradually incrassate towards apex 21

— Pronotum with a single type of pubescence or if not, the second antennal segment very slender at base and incrassate only apical half or so 23

21. First antennal segment large, compressed, with two types of pubescence (Asia, Africa, East Indies, Pacific Is.) .... *EURYSTYLUS* Stål, 1870

— First antennal segment cylindrical, with one type of pubescense 22

22. Scutellum strongly raised distally; cuneus about as long as wide at base; first antennal segment about as thick as apex of second segment (North America) .... *PYCNOCORIS* Van Duzee, 1914

— Scutellum moderately convex; cuneus longer than wide at base; first antennal segment not as trick as apex of second segment (Americas) ...... *NOTHOLOPUS* Bergroth, 1922

23. Body strongly shining; pronotum erectly and hemelytra adpressed pilose; rostrum reaching middle of mesosternum (Madagascar) .... *SCHOUTEDENIELLA* Poppius, 1912

— Body not noticeably shining; pronotum and hemelytra with same type of pubescence 24

24. Pronotum finely rugouse, almost glabrous, body totally black above (North America) .... *ECTOPIOCERUS* Uhler, 1890

— Pronotum not rugouse, pubescent, body not totall black above 25

25. Vertex sulcate in middle; rostrum reaching the middle coxae; second antennal segment thickest at apex 26

— Vertex smooth; second antennal segment thickest on apical third; rostrum reaching the posterior coxae (fig. 179) (Americas) .... *GARGANUS* Stal, 1858

26. Pronotum constricted anteriorly; the anterior portion much lower than posterior; jugum very large and prominent (Tauria) .... *EPIMECELLUS* Reuter, 1894

— Pronotum not constricted anteriorly; jugum not noticeably large and prominent (Tasmania) .... *PSEUDOPANTILIUS* Reuter, 1905

27. First segment of hind tarsi distinctly longer than third (fig. 23) 28

— First segment of hind tarsi not longer than third (fig. 29) 31

28. Large species with cuneus long and pointed, about three times as long as wide; head and pronotum covered by black setiform hairs, the latter faintly rugose; lorum very small gena produced apically somewhat tubercular, touching apex of jugae (Burma) .... *CHEILOCAPSUS* Kirkaldy, 1902

— Small or medium size species with shorter cuneus; body without setiform hairs or if so, then gena not as above 29

29. Head much longer than wide, distinctly pointed in front, somewhat horizontal (India) .. *ZALMUNNA* Distant, 1909

— Head about as long as wide, not pointed in front, vertical 30

30. Eyes slightly removed from pronotum; second antennal segment thinner than first (Europe, Asia, Africa, India, North America) .... *STENOTUS* Jakovlev, 1877

— Eyes contiguous with pronotum; second antennal segment as thick as first (Africa) .... *LYGOPSIS* Poppius, 1912

31. Dorsal surface distinctly pubescent, dull 32
— Dorsal surface glabrous, highly polished, sometimes rugose or rough with esparse, few and short hairs 71
32. Hemelytra covered by dark recumbent hairs plus scale-like hairs; cuneus about as wide as long, membrane very short, hemelytra rounded externally (New Zealand) .... *CHINAMIRIS* Woodward, 1951
— Hemelytra with a single type of hairs or if scale-like hairs present then cuneus longer than wide, membrane long and hemelytra not rounded externally 33
33. First antennal segment as long as or longer than head and pronotum together; frons horizontal slightly protruding over base of clypeus; rostrum reaching the fourth visible abdominal segment (North America) .. *PALLACOCORIS* Reuter, 1876
— First antennal segment not as long as head and pronotum together or if so then rostrum shorter and frons not as above 34
34. Collar very wide, about, 1-1/2 times as trick as first antennal segment: eyes removed from pronotum, prominent; dark species with luteous markings, the embolium usually flavous or yellowish (Europe, Asia, N. Africa) .... *CAPSODES* Dahlbom, 1851
— Collar not noticeably wide; if the eyes removed from pronotum then the head with a short neck 35
35. Body covered with stiff black setiform bristles; head with a short neck; eyes slightly removed from anterior margin of pronotum; legs and antennae with many bristles; rostrum reaching the middle coxae (aspect of *Dicyphus*) (fig. 188) .... *PAMERIDEA* Reuter, 1906
— Body with other type of pubescence or if setiform hairs present, the eyes contiguous to pronotum and head without a short neck 36
36. Pronotum carinate at sides; vertex sulcate (fig. 192) .. 37
— Pronotum not carinate laterally 38
37. Body covered by short setiform black bristles; rostrum reaching beyond middle coxae; vertex shallowly sulcate (Asia, North America) .... *ALLORHINOCORIS* Reuter, 1876 *
— Body covered by short setiform black and adpressed bristles plus woolly silvery hairs; rostrum not reaching the middle coxae; vertex deeply sulcate (fig. 192) (Europe, Asia) .... *PANTILIUS* Curtiss, 1833

* The genus *Apantilius* Kiritchenko, 1951 runs to this couplet of the key.

38. Hemelytra with black setiform hairs and silvery silky pubescense (the bristles sometimes seen only on exocorium) . . 39
— Hemelytra with a single type of pubescence 43

39. Rostrum not reaching beyond the apex of hind coxae .. 40
— Rostrum reaching beyond the apex of hind coxae 42

40. Vertex sulcate longitudinally; rostrum reaching the apex of hind coxae (Asia) .... *PARAPANTILIUS* Reuter, 1904
— Vertex smooth; rostrum reaching the apex of middle coxae 41

41. First and second antennal segments linear or so; tibiae compressed and carinate on upper margin with strong black spines, the posterior tibiae distinctly curved (Iindia) .... *LUCITANUS* Distant, 1904
— First and second antennal segments fairly thick; tibiae not as above (Africa) .... VOLUMNUS Stål, 1865

42. Rostrum reaching the 8th abominal segment; first antennal segment without long, dense and rigid setae; tibiae without long spines (North America) .... *ECERTOBIA* Uhler, 1909
— Rostrum not reaching the 8th abdominal segment; first antennal segment with long, dense and rigid setae; tibiae with long spines (Africa) .... *TRICHOBASIS* Reuter, 1904

43. First antennal segment longer than width of head (fig. 198) 44
— First antennal segment shorter or equal to width of head 48

44. Vertex sulcate longitudinally; frons striolate; third antennal segment equal in length to first; second slightly longer than third; long parallel sided species (fig. 198) (Cosmopolitan) .... *CREONTIADES* Distant, 1883
— Vertex not sulcate, frons not striolate 45

45. Eyes removed from anterior margin of pronotum by an espace about equal to length of one eye; claval vein distinctly raised; pubescence black and setiform (Europe, Asia) .... *ODONTOPLATYS* Fieber, 1858
— Eyes contiguous with anterior margin of pronotum or so; claval vein not raised 46

46. Posterior femora compressed, fairly narrowed towards the apex; membrane marmorate (as in *Phytocoris*) (North Africa) .... *EREMOBIELLUS* Reuter ,1895
— Posterior femora not compressed and noticeably narrowed towards apex; membrane not marmorate 47

47. Eyes somewhat removed from anterior margin of pronotum (New Guinea) .... *AUSTROPEPLUS* Poppius, 1915

— Eyes contiguous with anterior margin of pronotum; species of large size; body not densely pubescent; cuneus longer than wide (Asia, India) .. *TRICHOPHORONCUS* Reuter, 1896

48. Elongate species with brachypterous females; males with cuneus two and half times as long as wide at base; tibiae with long spines; pronotum situate laterally, strongly narrowed towards apex; females without distinct cuneus and membrane 49

— If brachypterism occurs in females, then cuneus less than two and half times as long as wide at base; tibiae without noticeable long spines; pronotum not strongly narrowed in front; females with cuneus and membrane 50

49. Pronotum sinuate laterally; clypeus flattened, scarcely convex; eyes inclined forward; cuneus absent on females (Asia, Europe) .... *ALLOEONOTUS* Fieber, 1858

— Pronotum not sinuate laterally; clypeus arcuate-convex; eyes vertical in position; cuneus distinct on females (North America) .... *STTITOCAPSUS* Knight, 1942

50. Rostrum reaching slightly beyond apex of anterior coxae; body long and erectly pilose (Asia, Europe, North Africa) .... *BRACHYCOLEUS* Fieber, 1858

— Rostrum reaching the middle coxae or beyond 51

51. Black species with jugum separated from lorum by a deep suture; first rostral segment much thicker than others; body above rugose, often with punctate aspect (North America) .... *IRBISIA* Reuter, 1879

— Species if black, without the combination of characters above 42

52. Scutellum strongly tumid and steep posteriorly, feebly declivous towards apex; body covered by adpressed, silvery pubescence (New Guinea) .... *PELTIDOPEPLUS* Poppius, 1912

— Scutellum not strongly tumid or if so, the body without silvery adpressed pubescence 53

53. Eyes removed from pronotum by a distance about equal to or more than thickness of second antennal segment; collar wide, calli large and confluent, reaching the lateral margins of pronotum, the latter somewhat depressed behind calli (figs. 186, 187) 54

— Eyes contiguous with pronotum or if not then calli not large, not confluent or reaching lateral margins of pronotum (fig. 203) 57

54. Collar very wide with mesal length about equal to half the width of one eye; pubescence long, fine and erect (Europe) .... *DIONCONOTUS* Reuter, 1894
— Collar about as thick as first antennal segment; pubescence short and adpressed, easily rubbed off 55
55. Calli vermiculate sculpturated; posterior lobe of pronotum carinate at middle (Corsica) .... *RHABDOSCYTUS* Horvath, 1924
— Calli not as above; pronotum without a carina on posterior lobe 56
56. Frons strongly swollen in front (fig. 187); pronotum distinctly narrowed and somewhat constricted in front (Europe, Asia) .... *GRYPOCORIS* Douglas & Scott, 1868
— Frons not noticeably swollen in front; pronotum not constricted in front (fig. 186) (Europe) .... *HADRODEMUS* Fieber, 1858
57. First antennal segment almost as thick as diameter of eye (fig. 203), slender at base, the others very slender; posterior femora very thick, tibiae with long spines; pronotum and cuneus strongly declivous; hemelytra adpressed pilose, pronotum with setiform and silky pubescence (South America) .... *POEAS* Distant, 1893
— First antennal segment not as above; posterior femora not noticeably thick; pubescence not as above 58
58. Body above covered with short black setiform bristles, especially visible on sides of pronotum and exocorium 59
— Body above covered with hairy pubescence only, without setiform bristles 61
59. Corium with very prominent veins, the cubital branched at apex; first segment of hind tarsi thicker than second, deeply excised at apex, longer than second; pronotum with lateral margins acute anteriorly; females identical to males, cuneus more than twice as long as wide 60
— Corium without prominent veins; pronotum with rounded lateral margins; females with very short membrane, the cuneus as long as wide at base (Europe) .... *HORVATHIA* Reuter, 1881
60. Body oval; head seen from above as long as wide, eyes contiguous with pronotum; rostrum reaching slightly beyond middle coxae; first rostral segment reaching middle of xyphus (Europe) .... *ACTINONOTUS* Reuter, 1896
— Body subelongate; head seen from above much longer than wide; eyes somewhat removed from pronotum; rostrum reach-

ing the base of head (Europe, North America) .... *MIRIS* Fabricius, 1794

61. Vertex longitudinally sulcate; body escarcely pubescent, almost glabrous or with very long, erect and esparse pubescence 62

— Vertex not sulcate longitudinally; body distinctly pubescent 64

62. Body with short golden and black pubescence (North Africa) .... *REUTERISTA* Kirkaldy, 1904

— Body almost glabrous or with long, erect pubescence 63

63. Body almost glabrous; eyes not very large; antennae not noticeably long; hemelytra not shagrine (Europe, Asia, Africa, Australia) .... *MEGACOELUM* Fieber, 1858

— Body than long, erect pubescence; eyes very large; antennae longer than the body; hemelytra finely shagrine (Ceylon) .... *PHARYLLUS* Distant, 1904

64. Rostrum reaching beyond apex of posterior coxae; head broad eyes procticalIy in contact with pronotal angles, hind margin of eyes somewhat flattened and forming an arcuate line with base of vertex 65

— Rostrum not reaching beyond apex of posterior coxae; head not unusually bread, eyes convex behind and well removed from pronotau angles 66

65. Vertex distinctly carinate; head very short, vertical, eyes compressed; pubescence not silky (India) .... *SAPINNIUS* Distant, 1909

— Vertex not carinate; head not noticeably short and vertical; eyes not strongly compressed; pubescence not noticeably silky (Europe, North America) .. *DICHROOSCYTUS* Fieber, 1858

66. Second antennal segment about as thick as or thicker than first; eyes large, margined posteriorly (fig. 201); clavus with dull tomentose dust (Africa, Pacific Is.) .... *SIDNIA* Reuter, 1905

— Second antennal segment slender than first; eyes not margined posteriorly; clavus without tomentose dust 67

67. Head strongly pointed in front; vertex carinate; upper surface of body rugose; pronotum with a slight median impression (Africa) .... *CIXACORIS* Poppius, 1912

— Head not strongly pointed; body smooth; pronotum convex or flat, not impressed 68

68. Thickness of fourth antennal segment almost equal to that of base of second segment; mesal length of collar subequal to

thickness of fourth antennal segment (fig. 219) (Cosmopolitan) .... *ADELPHOCORIS* Reuter, 1896

— Fourth antennal segment distinctly thinner than base of second segment; mesal length of collar distinctly greater than thickness of fourth segment 69

69. Pronotum glabrous, shining; pubescence of hemelytra very short (North America) .... *GANOCAPSUS* Van Duzee, 1912

— Pronotum pubescent; pubescence of hemelytra not noticeably short 70

70. Vertex finely carinate; collar very slender (Java) .... *CALOCOROPSIS* Popius, 1914

— Vertex not carinate; collar not noticeably slender (fig. 38) (Cosmopolitan) .... *CALOCORIS* Fieber, 1858

71. Rostrum short, escarcely surpassing anterior coxae or reaching middle of mesosternum, in a few species reaching anterior margin of middle coxae (India) .... *LIOCAPSUS* Poppius, 1915

— Rostrum longer, reaching at least posterior margin of middle coxae 72

72. Vertex distinctly sulcate (Central America) .... *JACCHINUS* Distant, 1873

— Vertex not distinctly sulcate or only very finely so 73

73. Eyes very large, compressed, smooth behind, touching the anterior angles of pronotum and gula below, strongly reniform in front; vertex thickly margined; first antennal segment shorter or equal to with of vertex (Africa) .... *LYGIDOLON* Reuter, 1907

— Eyes not compressed or touching anterior angles of pronotum and gula below; vertex not marginate; first antennal segment longer than width of vertex 74

74. Large species over 10 mm long; scutellum rugose, impressed longitudinally; clypeus strongly prominent (New Guinea) .. .. *MACROPEPLUS* Poppius, 1912

— Smaller species with smooth scutellum, not impressed longitudinally; clypeus not noticeably prominent 75

75. Eyes compressed and large; body opaque; pronotum strongly declivous (Madagascar) .... *ADELPHOCORIDEA* Poppius, 1912

— Eyes not compressed; body shining; pronotum not strongly declivous 76

76. Posterior tibiae with spines throughout; lorum prominent, somewhat carinate (Americas) .... *HORCIAS* Distant, 1884

— Posterior tibiae with only a few apical spines; lorum not noticeably prominent (Java) ... *GIANELLA* Poppius, 1914

77. Head horizontal, vertex longitudinally sulcate and striolate; jugum very prominent, set off as two pointed tubercles at the sides of clypeus; third and fourth joints of antennae minute; rostrum reaching the posterior coxae (Central America) .... *MINYTUS* Distant, 1883

— Jugum and vertex not as above; if third and fourth joints of antennae minute, the rostrum reaching the middle coxae 78

78. Body covered by very long, fine and erect pubescence, especially on exocorium and scutellum; hemelytra with silvery areas or adpressed silky or wooly pubescence amongst the erect hairs 79

— Body shortly pilose or if long pilose, the hemelytra without silvery spots or silky or woolly pubescence intermixed with long hairs 83

79. Pubescence of hemielytra with silky silvery adpressed hairs amongst the erect pubescence; or silvery tomentose areas present (Ceylon) .... *DIOGNETUS* Distant, 1904

— Pubescence of hemelytra with silvery tomentose spots on hemielytra, simetimes also a few short silvery hairs 80

80. Pronotum strongly convex at middle of disc, with a tubercular elevation (an erect lobe) (fig. 210) (Formosa) .... *TINGINOTOPSIS* Poppius, 1915

— Pronotum not as above 81

81. Embolium without transverse dark and hyaline fasciae; pubescence of body not noticeably long (Ceylon) .... *ARGENIS* Distant, 1901

— Embolium with transverse dark and hyaline fasciae; body pubescence very long 82

82. Rostrum reaching apex of mesosternum; embolio-corial commissure at base with punctures; head somewhat produced between antennae (Fiji, Samoa) .... *NESODAPHNE* Kirkaldy, 1908

— Rostrum reaching the posterior coxae or beyond; embolio-corial commissure without punctures; head not produced anteriorly (India, Africa, Java, Philippines, etc.) .... *TINGINOTUM* Kirkaldy, 1902

83. First antennal segment noticeably enlarged, compressed or foliaceous or with two first segment noticeably thick (fig. 200) 84

— Firts antennal segment if enlarged, cylindrical, or first two segments not noticeably thick (fig. 201) 85

81. Head more or less horizontal, acutely pointed in front; pronotum strongly narrowed and declivous; first antennal segment without bristles and scale-like hairs (fig. 200) (Ceylon) .... *CLAPMARIUS* Distant, 1904

— Head not horizontal; pronotum not strongly narrowed in front; first antennal segment with bristles and scale-like or woolly hairs (Formosa) .... *EURYSTYLOMORPHA* Poppius, 1915

85. Second antennal segment distinctly clavate 86

— Second antennal segment linear or so 91

86. Upper surface with golden yellowish scale-like pubescence; hemelytra rugose, vertex carinate (Peru) .... *ACANTHOPEPLUS* Poppius, 1912

— Upper surface without scale-like pubescence 87

87. Body (except hemelytra) very long and erectly pilose (Africa) .... *TRICHOCAPSUS* Poppius, 1912

— Body without noticeably long pubescence 88

88. Pronotum erectly and hemelytra shortly adpressed pilose; first antennal segment ver short and thick (North Africa) .... *HISTRIOCORIDEA* Poppius, 1912

— Body pubescence not as above; first antennal segment not noticeably thick 89

89. Hemelytra covered by silky adpressed pubescence; scutellum transversally rugose; rostrum surpassing slightly the apex of anterior coxae (Tonkin) .... *THANIA* Poppius, 1915

— Hemelytra without silky adpressed pubescence; scutellum not transversally rugose; rostrum longer 90

90. Vertex very wide and with a median shallow depression; jugum strongly tumid; frons smooth, pronotum punctate (fig. 197) (Europe, Asia, North America) .... *CAPSUS* Fabricius, 1803

— Vertex not noticeably wide, without median depression; jugum not strongly tumid; frons striolate; pronotum rugose (Africa) .... *PSEUDORTHOTYLUS* Poppius, 1914

91. Pronotum strongly declivous; scutellum strongly prominent; hemelytra shagrine covered by small scale-like dehiscent hairs; cuneus strongly inclined (fig. 185) (Central & South America) .... *DEROPHTHALMA* Berg, 1883

— Pronotum if strongly declivous, the scutellum not as above or if so, then the hemelytra without adpressed scale-like hairs giving shagreened appearance 92

92. Head short, vertical, wide, frons striolate and sulcate; eyes large, compressed, occupying the sides of the head; pronotum

strongly punctate, hemelytra beset with golden adpressed pubescence or this type plus common hairs (fig. 193) 93
— Head not as above, if frons striolate then hemelytra with other type of pubescence or pronotum not strongly punctate 95
93. Antennae with short hairs and long, erect fine setae; hemelytra with erect hairs intermixed with adpressed ones (fig. 193) (Central & South America) .. *CALOCORISCA* Distant, 1884
— Antennae with a single of pubescence; hemelytra with a single type of pubescence 94
94. Body with dense golden adpressed pubescence; membrane very short and densely pubescent (Central & South America) .... *EUCHILOCORIS* Reuter, 1907
— Body not noticeably densely pilose; pronotum and scutellum strongly punctate; membrane glabrous (Venezuela) .... *CHRYSODASIA* Reuter, 1892
95. Hemelytra clothed with distinct silvery or woolly or silky pubescence, single or mixed with fine, erect hairs, sometimes easily rubbed off 96
— Hemelytra glabrous or clothed with only a single type of pubescence, sometimes semiadpressed but never truly silky or woolly 106
96. First antennal segment very thick, as wide as width of one eye; pronotum with three colloused lines anteriorly on the sides (Australia) .... *DIRHOPALIA* Reuter, 1905
— First antennal segment not as thick as width of eye; pronotum without the lines above 97
97. Pronotum with a median subexcavated dull spot behind calli; scutellum strongly tumid; pubescence of black stiff bristles and silvery hairs (India) .... *EURYSTYLOPSIS* Poppius, 1911
— Pronotum without the spot above; scutellum not noticeably tumid or if so, then body pubescence not as above 98
98. Pronotum with two dull depressed black spots (as in *Taedia*), covered by black bristles only (Africa) .... *PLESIOCAPSUS* Bergroth, 1926
— Pronotum without two dull black spots as above or if so, then pronotum with woolly pubescence 99
99. Body covered by silky pubescence intermixed with erect and fine hairs; pronotum coarsely and deeply punctate; scutellum flat (Java) .... *GORNA* Poppius, 1914 *

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* The genus *Salignus* Kelton, 1955 (North America) reaches also this couplet of the Key.

— Body covered by adpressed pubescence only; pronotum finely punctate or if coarsely punctate then scutellum tumid 100

100. Head strongly pointed in front; claws toothed at base; ostiolar peritreme very large (Africa, India, Madagascar, Java, etc.) .... *PROBOSCIDOCORIS* Reuter, 1894

— Head not strongly pointed in front or if so, then claws not toothed at base or ostiolar peritreme not very large 101

101. Scutellum strongly tumid 102

— Scutellum not strongly tumid 103

102. Pronotum coarsely punctate, glabrous (India) .... *PELTIDOLYGUS* Poppius, 1915

— Pronotum finely rugouse punctate, dorsum clothed with silvery woolly adpressed pubescence (North America) .... *CALYPTODERA* Van Duzee, 1923

103. Pronotum somewhat rugose punctate; rostrum reaching thé VI to VII abdominal segment; elongate species with the aspect of *Lygus* but with silvery hairs amongst the pubescence of hemelytra (India, Ceylon) ...... *ELTHEMUS* Distant, 1909

— Pronotum not rugose; rostrum shorter, pubescence distinctly silky: usually roundish dark species 104

104. Pronotum esparsely punctate, strongly shining, scantily pubescent: hemielytra somewhat rugose punctate (Asia, India) ... . *LIOCORIDEA* Reuter, 1903

— Pronotum distinctly pubescent; hemelytra not rugosely punctate 105

105. First and second segments of hind tarsi equal in length; collar with mesal length larger than thickness of first antennal segment (Europe, Asia, Africa) .... *CHARAGOCHILUS* Fieber, 1858

— First segment of hind tarsi distinctly shorter than second; collar with mesal length equal to thickness of first antennal segment (Cosmopolitan) .... *POLYMERUS* Westwood, 1839

106. Pronotum strongly convex above and rounded laterally, brilliant, calli not visible, collar very fine and depressed covered by the vertex which is sharply carinate and continuous with posterior margin of eyes; scutellum strongly tumid raising much above the surface hemielytra, claval comissure shorter than scutellum (Ceylon, Java) ..... *BERTSA* Kirkaldy, 1901

— Pronotum and collar not as above, if so then scutellum not noticeably tumid or eyes different 107

107. Head longer than wide, together with collar about as long as pronotum, shallowly sulcate at middle, somewhat horizontal, clypeus very large; eyes distant from pronotum by an

espace equal to diameter of first antennal segment; pronotum strongly narrowed in front; first antennal segment almost as long as head and pronotum together (fig. 221) (Africa) ... . *KIAMBURA* China, 1936

— Head and first antennal segment not as above 108

108. Pronotum distinctly punctate between calli and posterior to collar (fig. 190) 109

— Pronotum impunctate or rugose between calli and posterior to collar 117

109. Small highly polished deeply and coarsely punctate almost hairless species; vertex thickly margined; pronotum strongly declivous; corium punctate only near claval commissure and on embolio-corial commissure (fig. 204) (Samoa) .... *PLESIOLYGUS* Knight, 1935

— Body surface not as above or if so, then vertex smooth, pronotum not strongly declivous, corium otherwise puctate .. 110

110. Lateral margins of pronotum not carinate; form more elongate and subparallel 111

— Lateral margins of pronotum carinate or at least with a calloused line; form ovoid or body very strongly punctate, pronotum with the espace between punctures forming here and there tubercular swellings 116

111. Rostrum reaching the 5th abdominal segment 112

— Rostrum not reaching the 5th abdominal segment 113

112. Antennae inserted distinctly below apex of eye; ostiolar peritreme indistinct; hemelytra rugosely punctate (Suecia) .... *ZYGIMUS* Fieber, 1870

— Antennae inserted above apex of eye; ostiolar peritreme distinct; hemelytra punctate only (Europe, Asia) .... *CAMPTOZYGUM* Reuter, 1896

113. Membrane finely and densely pilose; head smooth, rostrum reaching the middle coxae (Africa) .... *YNGVEELIA* Poppius, 1912

— Membrane smooth, head punctate or striolate 114

114. First antennal segment as long as width of head; species of large size, frons striolate (fig. 195) (Central & South America) .... *PIASUS* Distant, 1883

— First antennal segment shorter than width of vertex; species of medium size 115

115. Frons striolate; second antennal segment five times as long as first segment (North America) .... *NEOBORELLA* Knight, 1925

— Frons striolate; second antennal segment only three or two times as long as first (North America) .... *XENOBORUS* Reuter, 1908

116. Pronotum with tubercular swellings amongst punctures; hemielytra almost glabrous (fig. 205) (Central & South America) .... *MONALOCORISCA* Distant, 1884

— Pronotum without tubercular swellings amongst punctures; hemielytra pubescent (Americas) .... *TROPIDOSTEPTES* Uhler, 1878

117. Body glabrous, shining, if a few and very short hairs present, then scutellum smooth 118

— Body distinctly pubescent, if a few hairs present, then scutellum rugouse or punctate 125

118. Rostrum not reaching the middle coxae; body almost glabrous, shining (Americas) .... *POECILOCAPSUS* Reuter, 1876

— Rostrum reaching the middle coxae or beyond 119

119. Hemelytra translucent; vertex striolate; species of large size (North America) .... *PLATYLYGUS* Van Duzee, 1915

— Hemelytra not translucent or if so, then vertex not striolate; species of medium and small size 120

120. Head very wide and short, eyes straight and smooth posteriorly internal margin of orbita level with outer margin of collar; head bisinuate in front, vertex carinate (Samoa) .... *PAUROLYGUS* Knight, 1935

— Head not as above 121

121. Rostrum reaching the middle coxae 122

— Rostrum reaching the posterior coxae or beyond 124

122. Pronotum and scutellum trausversally rugouse; hemielytra rugouse and punctate; tibiae with spines and long setae (Africa) .... *ALLOEOCHRUS* Reuter, 1905

— Pronotum and scutellum not rugouse; tibiae without setae

123. Vertex carinate; membrane very short; cuneus as long as wide (Central & South America) .... *RHASIS* Distant, 1893

— Vertex smooth; membrane not noticeably short; cuneus longer than wide (Asia) .... *LHSTONOTUS* Reuter, 1906

124. Hemielytra with a few bristles on exocorium; rostrum reaching the posterior coxae; vertex striolate; punctures on pronotum shallow and large (Astralia) .... *RHODOLYGUS* Poppius, 1915

— Hemielytra without a few bristles on exocorium; ristrum reaching apex of pesterior coxae; vertex smooth; punctures of pronotum small (Americas) .... *PROBA* Distant, 1883

125. Vertex with median longitudinal sulcus; lorum prominent and carinate; membrane short and densely pilose; pronotum strongly shining (fig. 183) (Central & South America) .... *CALONDAS* Distant, 1883

— Vertex not sulcate or if so, lorum not prominent or carinate; membrane glabrous 126

126. First and second antennal segments thickly clothed with heavy black pubescence; large red species (North America) ....*COCCOBAPHES* Uhler, 1878

— First Antennal segment more esparsely clothed with pale pubescence or if black, colour not red 127

127. Pronotum with lateral margins sharply angulate, carinate near posterior angle; body red or brick red and black; clavus without punctures (Americas) ...... *NEOCAPSUS* Distant, 1884

— Pronotum with lateral margins rounded or angulate, not carinate, but if so, then clavus with two rows of punctures 128

128. Pronotum slightly carinate on lateral anterior margin; clavus beset with one row of punctures on each side of claval vein; large species with pronotum strongly punctate, almost glabrous, frons striolate (Sumatra) .... *TOLONGIA* Poppius, 1915

— Pronotum not carinate; clavus without punctures 129

129. Pronotum distinctly and coarsely rugose transversally, with punctures mostly obscured by rugosities 130

— Pronotum punctate but not rugose, sometimes only very finely so 135

130. Pubescence very short and esparse; rostrum reaching apex of middle coxae 131

— Pubescence not as above; rostrum reaching the hind coxae or beyond 132

131. Calli large, confluent, reaching sides of pronotum; width of vertex greater than width of an eye (Europe, North Africa, Asia) .... *PLESIOCORIS* Fieber, 1861

— Calli small, not confluent our reaching sides of pronotum; width of vertex less than width of an eye (North America) .... *NEOBOROPS* Uhler, 1895

132. Antennae very long, first segment as long as head and collar together, the second segment equal in length to third; pronotum distinctly narrowed anteriorly (Africa) .... *BUTTNERIELLA* Poppius, 1912

— Antennae shorter, not as above, pronotum not noticeably narrowed anteriorly 133

133. Head very wide, vertex twice the dorsal width of an eye, carinate: eyes extending beyond anterior angles of pronotum; small species not over 5.5 mm long (North America) .... *BOLTERIA* Uhler, 1877

— Head and vertex not as above 134

134. Body almost glabrous, the hemielytra smooth; rostrum reaching the 6th abdominal segment (New Guinea) .... *ARISTOPEPLUS* Poppius, 1912

— Body long, fine and erectly pilose; hemielytra rugosely punctate: rostrum not reaching the 6th abdominal segment (Africa) .... *HORVATHIELLA* Poppius, 1912

135. Pronotum pisceous, strongly shinnig; hemielytra black, opaque; area between calli distinctly rugose (Europe) .... *SAUNDERSIELLA* Reuter, 1890

— Pronotum not as above: area betwenn calli smooth 136

136. Second antennal segment shorter or about as long as width of head across eyes (Europe, North America) .... *AGNOCORIS* Reuter, 1875

— Second antennal segment distinctly longer than width of head acros eyes 137

137. Frons tumid, somewhat sulcate, distinctly striolate; elongate species with pronotum strongly declivous 138

— Frons if tumid not striolate or sulcate 139

138. Rostrum reaching the 4th or 5th abdominal segment; pronotum pubescent (Africa) .... *MACEDANUS* Bergroth, 1920

— Rostrum reaching the hind coxae or nearly so; pronotum almost glabrous (India, China) .... *PHILOSTEPHANUS* Distant,, 1909

139. Large elongate species parallel sided (males), oval or as wide at base, with approximate same width throughout; body almost glabrous (North Africa, Asia Minor) .... *ISCHNOSCELICORIS* Reuter, 1886

— Species if large or elongate then cuneus much shorter, body pubescence distinct 140

140. Head pointed between antennae, somewhat horizontal; second antennal segment about as thick as first; third and fourth very short; rostrum reaching the 7th abdominal segment; body pubescence very short and scanty (Central America) .... *PAPPUS* Distant, 1883

— Head not noticeably pointed between antennae, vertical; second attennal segment as well as third and fourth not as above or if so then rostrum shorter 141

141. Scutellum strongly tumid, much higher than pronotum; rostrum not reaching middle coxae; body with long, erect hairs (fig. 189) (Chile) .... *CHILEAIA* Carvalho,
— Scutellum if tumid not higher than pronotum 142
142. Pronotum distinctly and densely punctate, hairs usually adpressed or subadpressed 143
— Pronotum shallowly and esparsely puctate, hairs usually erect, fine and long 148
143. Hind tibiae black or with a black spot or ring 144
— Hind tibiae unicolorous, pale 145
144. Rostrum reaching the middle coxae; hemielytra not rugose punctate; second antenna short and incrassate (Africa) .... *HISTRIOCORIS* Reuter, 1905
— Rostrum reaching the hind coxae; hemielytra rugose punctate; second antenna long and incrassate only at apex (holartic) .... *EXOLYGUS* Wagner
145. Third segment of hind tarsus longer than second; hind femora much stouter than others (Europe, North Africa) .... *CYPHODEMA* Fieber, 1858
— Third segment of hind tarsus as long as or shorter than second; hind femora not much stouter than others 146
146. Pronotum rugose punctate; species over 5.5 mm long (Asia, North America) .... *LYGIDEA* Reuter, 1875
— Pronotum punctate but not rugose; species less than 5.5 mm long 147
147. First and second antennal segments incrassate, diameter of second segment equal to diameter of fore tibia (Formosa) .. .. *EOLYGUS* Poppius, 1915
— First and second antennal segment not incrassate or very slightly so, greatest diameter of second antennal segment not equal to diameter of fore tibiae (Europe, North Africa, Asia, North America) .... *ORTHOPS* Fieber, 1858
148. Frons with four to five punctures above antennal fossa; (species of small size (India) .... *SABACTUS* Distant, 1910
— Frons without the puncturs mentioned above 149
149. Length of first antennal segment shorter than eye height, if this ratio equal then vertex noticeably sinuate at posterior margin 150
— Length of first antennal segment longer than eye height, if this ratio equal then vertex straight at posterior margin 153
150. Second antennal segment short, incrassate, densely pilose; body fairly long, erectly pilose (fig. 191) (Central and South America) .... *EUBATAS* Distant, 1884

— Second antennal segment if short or incrassate not densely pilose 151

151. Vertex straight posteriorly; second antennal segment four times longer than first segment; rostrum reaching the middle of abdomen (Asia, North America) .... *PINALITUS* Kelton, 1955

— Vertex sinuate a posterior margin; second antennal segment usually less than 4 times longer than first segment; rostrum usually reaching the hind coxae (may reach beyond) .. 152

152. To this couplet come the genera *Dagbertus* Distant, 1904 and *Taylorilygus* Leston, 1952. Since their separation based on external characters is difficult and the latter may prove to be a synonym of *Gutrida* Kirkaldy, 1902, further studies should be undertaken on the subject.

153. Rostrum reaching the middle or hind coxae; first antennal segment shorter than width of head (Europe, Asia, North America) .... *LYGUS* Hahn, 1833

— Rostrum reaching the middle of abdomen; first antennal segment longer than width o fhead 154

154. Haed seen from above more than twice as wide as long, facial angle acute (Venezuela) ... *NEOSTENOTUS* Reuter, 1905

— Head seen from above twice as wide as long, seen from side as long as high, facial angle straight (Brazil) .... *ALDA* Reuter, 1909

KEY TO SUBGENERA OF *LYGUS* HAHN

1. Transverse carina of vertex present but incomplete at middle, evident only near eyes .... *LYGUS* (*LYGUS*) Hahn

— Transverse carina of head complete 2

2. Tibial spines black .... *LYGUS* (*APOLYGUS*) China

— Tibial spines pale or brown ... *LYGUS* (*NEOLYGUS*) Knight

The following genera of Mirini are not included in the keys

Acanthocianella Poppius, 1914 (Acta Soc. Sci. Fenn. 44 (3): 114), near *Tropidophorella* Reuter, Zanzibar.

Amphicapsus China, 1931 (Ann. Zool. Jap. 13: 265), Japan.

Austrocapsus Kirkaldy, 1901 (Entom. 34: 116), allied to *Hyalopeplus*, Australia.

Diplotrichiella Poppius, 1915 (Ann. Mus. Hung. 13: 65), India.

Eblis Kirkaldy, 1902 (Trans. Ent. Soc. London, 256), allied to *Capsus*, India.

Gutrida Kirkaldy, 1902 (Entom. 35: 384), Gaboon.

Kangra Kirkaldy, 1902 (Trans. Ent. Soc. London, 257), allied to *Hyalopeplus*, India.

Liocapsidea Poppius, 1915 (Ann. Mus. Hung. 13: 16), near *Liocapsus*, India.

Macgregorius Kirkaldy, 1903 (Wien. Ent. Zeit. 22: 14), Queensland.

Mermitolecerus Reuter, 1907 (Ann. Mus. Zool. St. Peterb. 489), Asia.

Nesosylphas Kirkaldy, 1908 (Proc. Linn. Soc. N.S. Wales, 33: 379), Fiji.

Niastama Reuter, 1901 (Ofv. F. Vet. Soc. Forh. 47 (5): 11). Tasmania.

Octerocapsus Poppius, 1915 (Ann. Mus. Hung. 13:47), Australia.

Olympiocapsus Kirkaldy, 1902 (Trans. Ent. Soc. London, 255), China.

Pachypterna Fieber, 1858 (Wien. Ent. Monat. II: 304), Europe.

Poecilonotus Reuter, 1897 (Ofv. F. Vet. Soc. Forh. 38: 167). Asia Minor.

Ruspoliella Poppius, 1921 (Ent. Mitt. 10 (3): 82), near *Lamprocapsidea*, Africa.

Tropidophorella Reuter, 1907 (Ofv. F. Vet. Forh. 49 (7). 15). Africa.

Megacoelopsis Poppius, 1912 (Acta Soc. Sci. Fenn. 41 (3): 40), Africa.

Ommatodema Poppius, 1911 (Ofv. F. Vet. Soc. Forh. 53 A (3): 4). Tasmania.

KEY TO THE GENERA OF *MECISTOCELINI*

1. Rostrum reaching beyond the posterior coxae: cuneus a little longer than broad; hemielytra glassy transparent (fig. 44) (India) .... *MYSTILUS* Distant, 1901

— Rostrum reaching the middle coxae; cuneus much longer than broad; hemielytra opaque (India, Java) .... *MECISTOCELIS* Reuter, 1891

KEY TO THE GENERA OF *PITHANINI*

1. Species noticeably myrmecomorphic with abdomen strongly constricted at base and not covered by the very short hemielytra (fig. 254) (Europe, Asia) .... *MYRMECORIS* Gorski, 1852

— Species with a certain ant-like appearence but not noticeably myrmecomorphic, the abdomen covered at least pratically by the hemielytra 2

2. Length of first antennal segment less than width of vertex; pronotum not extending back to basal angles of hemielytra (Europe, Asia, N. Africa, N. America) .... *PITHANUS* Fieber, 1858

— Length of first antennal segment greater than width of vertex; pronotum extending back to basal angles of hemielytra (North America) .... *MIMOCEPS* Uhler, 1890

KEY TO THE GENERA OF *STENODEMINI*

1. Head strongly exserted with eyes placed near middle, thus far removed from anterior margin of pronotum, the distance between collar and eye equal to the width of one eye seen from above (fig. 174) 2
— Head not or only slightly exserted, the eyes in contact with pronotum or nearly so, the distance between collar and eye less than the width of one eye seen from above (figs. 175, 178) 5
2. First antennal segment about as long as head and pronotum together; frons strong and conically produced (Asia) .... *CHOROSOMELLA* Horvath, 1906
— First antennal segment shorter than head pronotum together; frons not strong and conically produced 3
3. Clypeus horizontal; pronotum carinate laterally (Africa) .... *NABIDOMIRIS* Poppius, 1914
— Clypeus vertical; pronotum not carinate laterally 4
4. Eyes somewhat pedunculate; body glabrous; pronotum smooth (Australia) .... *EURYMIRIS* Kirkaldy, 1902
— Eyes sessile; body pubescent; pronotum punctate (fig. 174) (Americas) .... *COLLARIA* Provancher, 1872
5. Hemielytra smooth or rugose, sometime very finely but never distinctly punctured 6
— Hemielytra distinctly and deeply punctured (fig. 176) 24
6. Pronotum coarsely and deeply punctate (fig. 176) (Cosmopolitan) .... *STENODEMA* Laporte, 1832
— Pronotum impunctate or only very finely or obscurely so 7
7. First antennal segment covered by long, erect pubescence, the hairs at least as long as half the width of the segment (fig. 175) 8
— First antennal segment covered by very short pubescence, the hairs shorter than half the width of the segment (fig. 178) 17
8. Frons rounded anteriorly, declivous, at most swollen or with a faint ridge; vertex with a median shallow depression (no true sulcus present); eyes slightly removed from pronotum (fig. 175) 9
— Frons with a prominent tubercle or anteriorly; vertex with a distinct longitudinal sulcus; eyes bordering pronotum or very near so (fig. 178) 13
9. Hemielytra completely glabrous and soft 10
— Hemielytra pubescent, hard and well chitinized 12

10. Second antennal segment distinctly incrassate toward the apex (Finland) .... *ACTITOCORIS* Reuter, 1880
— Second antennal segment linear 11
11. Pronotum constricted on anterior third, the anterior lobe rounded laterally (Australia) .... *AUSTROMIRIS* Kirkaldy, 1902
— Pronotum not constricted on anterior third, the lateral margins straight (India) .... *EBUTIUS* Distant, 1909
12. Body covered by long, erect pubescence; pronotum without a median constriction dividing it into an anterior lower and narrower portion and a posterior convex disk; lateral margin of pronotum distinctly carinate; no vestige of pronotal collar (fig. 175) (Europe, Asia, N. America) .... *LEPTOPTERNA* Fieber, 1858
— Body covered with semi-erect, stiff hairs; pronotum with an anterior constriction dividing it into an anterior lower and narrower portion and a convex posterior disk; lateral margins of pronotum rounded; a narrow pronotal collar present (Hawaii) .... *NESIOMIRIS* Kirkaldy, 1902
13. Frons protruding anteriorly, covering the base of or the whole clypeus when seen from above 14
— Frons not protruding anteriorly so as to cover the base or the whole clypeus when seen from above (fig. 178) 16
14. First segment of the hind tarsi distinctly shorter than the second and third together (Australia) .. *DASYMIRIS* Poppius, 1911
— First segment of the hind tarsi as long as or about as long as the second and third together 15
15. Body with fine, long and erect pubescence; first antennal segment about half as long as the head and pronotum together (India) .... *LASIOMIRIS* Reuter,. 1891
— Body almost glabrous; first antennal segment about as long as the head and pronotum together (Europe, Asia, Africa, Australia) .... *NOTOSTIRA* Fieber, 1858
16. Eyes small, rounded, slightly removed from pronotum; hemielytra rugose; rostrum reaching beyond apex of hind coxae (Java) .... *NOTOSTIROPS* Poppius, 1914
— Eyes of medium size, elongate, bordering pronotum; hemielytra smooth; rostrum not reaching base of posterior coxae (Europe, America, Africa, Asia) .... *DOLICHOMIRIS* Reuter, 1882
17. Head short and flattened, frons scarcely protruding beyond bases of antennae; the first antennal segment slender and curv-

ed, thickest near base then tapering to apex where on it enlarges again (fig. 184) (Europe, Asia, N. America) .... *TERATOCORIS* Fieber, 1858

— Head long or short but pointed, frons projecting sharply beyond bases of first antennal segment, which is not as above 18

18. Pronotum with one central and two lateral strongly developed carinae; head with a median depression, no longitudinal sulcus (Europe, Asia, North America, Africa) .... *ACETROPIS* Fieber, 1858

— Pronotum without a developed central carina; head with a distinct longitudinal sulcus 19

19. First segment of hind tarsi shorter or equal to third; body with reddish areas (India) .... *ZANESSA* Kirkaldy, 1902

— First segment of hind tarsi longer than third; body without reddish areas 20

20. Rostrum extending to base of abdomen; first antennal segment as long as head and pronotum together 21

— Rostrum not reaching beyond middle coxae; first antennal segment as long as head 22

21. First antennal segment as long as head and pronotum together; frons produced at base of clypeus (Cosmopolitan) .... *MEGALOCERAEA* Fieber, 1858

— First antennal segment shorter than head, frons not produced at base of clypeus (Africa) ..... *NYMANNUS* Distant, 1904

22. Pronotum distinctly carinate laterally 23

— Pronotum not carinate laterally; frons produced into a pointed tubercle (Tasmania) .... *PROTOMIRIS* Poppius, 1911

23. Hind tibiae with long erect pubescence; frons smooth, flat; first antennal segment almost glabrous (fig. 233) (Africa) ... . *SCHOUTEDENOMIRIS* Carvalho, 1951

— Hind tibiae with short pubescence; frons with a point or prominence; first antennal segment distinctly pubescent (figs. 105, 178) (Cosmopolitan) .... *TRIGONOTYLUS* Fieber, 1858

24. Posterior tibia very long and strongly pilose; brachypterous, the hemelytra without divisions (Juan Fernandez) .... *KUSCHELIANA* Carvalho, 1952

— Posterior tibiae not as above; macropterous 25

25. Rostrum reaching to or beyond the posterior coxae (Americas) .... *OPHTHALMOMIRIS* Berg, 1883

— Rostrum not quite reaching middle coxae (Americas) .... *PORPOMIRIS* Berg, 1881

KEY TO THE GENERA OF *HYALOPEPLINI*

1. Pronotum distinctly and coarsely punctate (fig. 218) 2
— Pronotum impunctate, sometimes rugose or only finely punctulate (fig. 225) 5
2. Collar punctate with mesal length equal to half the width of one eye (fig. 218) 3
— Collar not punctate and not as wide as above 4
3. Scutellum smooth above and strongly elevated (fig. 218) (Borneo) .... *MACROLONIDEA* Hsiao, 1944
— Scutellum punctate (Malay) .... *MACROLONIUS* Stäl, 1870
4. Head strongly vertical; rostrum reaching the 7th or 8th abdominal segment; eyes very large, occupying the whole sides of head; lorae strongly prominent (Malasia) .... *KOSMIOMIRIS* Kirkaldy, 1902
— Head not strongly vertical; rostrum not extending beyond apex of hind coxae; eyes not occupying the whole sides of head and lorae not noticeable prominent (Malay) .... *CHRYSORRHANIS* Kirkaldy, 1902
5. Pronotum coarsely rugose transversally (fig. 225) 12
— Pronotum smooth or very finely puctulate 6
6. Pronotum beset with numerous short bristles; first antennal segment incrassated towards base and apex 7
— Pronotum without short bristles; first antennal segment linear 8
7. A small tubercular flat process between inferior margin of antennal socket and eye; genae not carinate; antennae incrassated towards apex; large, elongate species (British Guiana) .... *IRIDOPEPLUS* Bergroth, 1910
— With the small tubercular process above; genae carinate on upper margin; antennae incrassated towards the base; medium sized species (Mauritius) .... *CORIZIDOLON* Reuter, 1905
8. Body polished glabrous; pronotum more or less carinated laterally (Africa) .... *PLEUROCHILOPHORUS* Reuter, 1905
Body pubescent; pronotum not carinated laterally 9
9. First antennal segment much shorter than width of head, the latter strongly vertical and transverse; the eyes very large, occupying the whole sides of head, contiguous with pronotum (New Guinea) .... *MOROCA* Poppius, 1912
— First antennal segment longer than width of head; eyes not occupying the whole sides of head, removed from pronotum 10

10. Pronotum very finely punctulate; first antennal segment almost twice as long as width of head (Philippines, Sumatra) .... *RAMBEA* Poppius, 1912
— Pronotum smooth; first antennal segment slightly longer than width of head 11
11. Pronotum strongly constricted anteriorly; body glabrous (Burma) .... *ONOMAUS* Distant, 1904
— Pronotum not constricted anteriorly; body pubescent (India, Philippines) .... *GUIANERIUS* Distant, 1903
12. Corium without veins 13
— Corium with veins (India, Malasia) .... *ISABEL* Kirkaldy, 1902
13. Embolium and cuneus distinctly pilose (New Guinea, Philippines) .... *HYALOPEPLOIDES* Poppius, 1912
— Embolium and cuneus glabrous 14
14. Clavus distinctly pubescent; first antennal segment longer than width of head (India, Samoa) .... *GUISARDUS* Distant, 1904
— Clavus glabrous; first antennal segment shorter or about as long as width of head 15
15. First antennal segment thicker at base; head vertical (fig. 225) (Mallaca) .... *EUHYALOPEPLUS* Hsiao, 1944
— First antennal segment incrassated towards the apex; head not noticeably vertical (Africa, India, Malay, Pacific Is.) .... *HYALOPEPLUS* Stål, 1870

KEY TO THE GENERA OF *RESTHENINI*

1. Scutellum strongly convex, with a longitudinal basal sulcus or impression; tibiae as thick as the femora, compressed, sulcate on both sides or inferiorly (fig. 260) (South America) .... *RESTHENIA* Spinola, 1837
— Scutellum not strongly convex, neither sulcate no impressed at base; tibiae cylindrical, not sulcate 2
2. Pronotal collar not reaching the sides of pronotum. The pronotum strongly carinate and produced anteriorly beyond sides of collar so as to enclose the latter (fig. 251) (Central & South America) .... *MIMONCOPELTUS* Kirkaldy, 1906
— Pronotal collar reaching the sides of pronotum, the latter not or much less strongly carinate as above (fig. 226) 3
3. Body oval, very wide; hemielytra widened laterally, distinctly wider than pronotum at base (fig. 216) 4

— Body elongate or oblong, parallel-sided; hemielytra rarely widened at middle, usually parallel or nearqly so, not or only slightly wider than pronotum at base 5

4. Second antennal segment thicker than first; tibiae without spines (South America) .. *EURYSCYTOPHORA* Reuter, 1909

— Second antennal segment more slender than first; tibiae very short (Chile) .... *EURYLOMATA* Reuter, 1909

5. Pronotum emarginate laterally and posteriorly 6

— Pronotum laterally nearly straight or slightly rounded, sometimes faintly sinuate behind collar but never at middle .. 7

6. Pubescence very short and scanty; anterior coxal cleft seen from above; slightly antmimic (Brazil) .... *KAMAIURANA* Carvalho, 1952

— Pubescence distinct and abundant; anterior coxal cleft seen from above; not antmimic (Argentina) .... *HETEROSCYTUS* Reuter, 1909

7. Head including eyes equal or only scarcely wider than collar; pronotum distinctly carinate laterally; second antennal segment equal in thickness to the first segment, linear (fig. 226) (South America) .... *CHILOXIONOTUS* Reuter, 1909

— Head including the eyes distinctly wider than collar; pronotum if carinate laterally, only at anterior portion and in this case with second antennal segment more slender than first segment or incrassate towards the apex (figs. 217, 227) 8

8. Body with brilliant metallic spots or areas; tibiae strongly incrassate towards the apices with densely subadpressed pubescent (South America) ...... *LAMPSOPHORUS* Reuter, 1909

— Body without brilliant metallic spots or areas; tibiae not strongly incrassate towards their apices, the pubescence more or less erect 9

9. Pronotum distinctly setose (true setae) (fig. 249) 10

— Pronotum glabrous, finely pubescent or shortly pilose, but never setose (figs. 217, 227) 11

10. Antennae and legs with uniform short pubescence, large species over 12 mm. long (fig. 249) (South America) .... *CALLICHILELLA* Carvalho, 1955

— Antennae and legs with numerous long setae in addition to the short pubescence; smaller species, less than 10 mm. long fig. 209) (Brazil) .... *MABELIA* Kirkaldy, 1903

11. Pronotum punctate or coarsely rugose; body narrow, subglabrous; tibiae with spines; cuneus of macropterous forms more than twice as long as wide at base (Chile) .... *STENOPAREDRA* Reuter, 1909

— Pronotum smooth, body usually not narrow, if so then the tibiae pilose; cuneus never more than twice as long as wide at base 12

12. First antennal segment shorter than width of vertex; second segment more than three times as long as first (fig. 214) (North & Central America) ...... *ONCEROMETOPUS* Reuter, 1875

— First antennal segment longer than width of vertex; second segment about twice as long as first 13

13. Pronotum distinctly carinate laterally behind the collar, on outer side of calli; the second antennal segment usually incrassate, as thick or thicker than first segment; species of large size, usually over 10 mm. long (fig. 227) (Central & South America) .... *PLATYTYLUS* Fieber, 1858

— Pronotum not distinctly carinate laterally, as above; second antennal segment more slender than the first, if incrassate, then the base thinner than first segment: species of medium or small size, usually less than 10 mm. long (fig. 217) (Americas) ... . *PREPOPS* Reuter, 1905

KEY TO THE GENERA OF *HERDONIINI*

1. Scutellum with an erect spine-like projection (fig. 213) .. 2

— Scutellum smooth, flat or convex, without a spine-like projection 8

2. Pronotum strongly constricted at middle, the anterior portion flat and horizontal (figs. 25F,252) (Central America) .... *ZACYNTHUS* Distant, 1884

— Pronotum not strongly constricted at middle 3

3. Head with a short neck, narrowed basally; eyes separated from pronotum by a distance about equal to the length of one eye (fig. 213) 4

— Head without a short neck, not narrowed basally; eyes bordering anterior margin of pronotum (fig. 222) 5

4. Cuneus imperceptibly merged with membrane; rostrum reaching middle coxae (fig. 213) (South America) .... *HERDONIUS* Stål, 1860

— Cuneus absent; rostrum reaching anterior coxae (fig. 39) (South America) ...... *GUARANIA* Carvalho & China, 1951

5. Pronotal collar distinct (fig. 222) 6

— Pronotal collar absent or indistinct 7

6. Legs with long, erect, white bristles; the hind tibiae straight (South America) .... *HAARUPIOLA* Poppius, 1921

— Legs without long, erect white bristles; hind tibiae fairly curved (South America) .... *HAARUPIA* Poppius, 1921

7. Vertex sulcate longitudinally; calli not distinct; hind tibiae fairly curved (fig. 177) (South America) .... *FIEBRIGIELLA* Poppius, 1921

— Vertex not sulcate longitudinally; calli distinct posteriorly; hind tibiae not curved (Americas) .... *BARBERIELLA* Poppius, 1914

8. Both sexes brachypterous; eyes distant from pronotum by a space equal or more than length of eye (fig. 255) (Europe & Asia) .... *CAMPONOTIDEA* Reuter, 1879

— At least one macropterous; eyes much closer to pronotum or contiguous with it 9

9. Hemielytra glabrous or with short, adpressed pubescence only, never with long erect bristles 10

— Hemielytra with long, erect bristles, sometimes intermixed with semi-erect pubescence 15

10. Pronotum raised posteriorly into a spine-like, erect projection (North America) .... *DACERLA* Cignoret, 1887

— Pronotum not as above 11

11. Posterior femora with long, erect bristles; posterior tibiae with long spines and small, dark tubercles (fig. 220) (Americas) .. .. *PARAXENETUS* Reuter, 1907

— Posterior femora without long, erect bristles; posterior tibiae with only a short pubescence or spines 12

12. Body glabrous; head with a short neck (Bolivia) .... *ACEGIMA* Poppius, 1921

— Body pubescent; head without a short neck 13

13. Eyes removed from anterior margin of pronotum; the latter strongly constricted in middle (Africa) .... *SPHINCTOTHORAX* Stål, 1853

— Eyes contiguous with pronotum, the latter not strongly constricted in middle 14

14. First antennal segment scarcely reaching the apex of head (North Africa) .... *LAURINIA* Reuter, 1881

— First antennal segment reaching distinctly beyond the apex of head (Africa) .... *XENETOMORPHA* Poppius, 1912

15. Scutellum strongly convex, with a prominent blunt median elevation and long, erect setae 16

— Scutellum, if convex, without a median blunt elevation 17

16. Rostrum scarcely surpassing middle of mesosternum (South America) .... *ALLOMMATUS* Reuter, 1907

— Rostrum reaching the base of posterior coxae (Central America) .... *ZOSIPPUS* Distant, 1883

17. Pronotal collar not visible, indistinct (Americas) .... *XENETUS* Distant, 1883

— Pronotal collar distinct (South America) .... *LEPIDOXENETUS* Poppius, 1921

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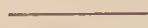
EXPLANATION OF FIGURES

Plate I

Tarsal claws: 1 — Fulvius brunneus. 2 — Cylapus tenuicornis. 3 Deraeocoris ruber. 4 — Eurychilopterella luridula. 5 — Psallus ancorifer. 6 — Monosynamma bohemanni. 7 — Rhinocapsus vanduzeei. 8 — Reuteroscopus ornatus. 9 — Lopus decolor. 10 — Macrotylus sexguttatus. 11 — Coquilletia mimetica. 12 — Dicyphus discrepans. 13 — Dicyphus famelicus. 14 — Systellonotus triguttatus. 15 — Hallodapini sp. 16 — Hallodapus corizoides. 17 — Pycnoderes dilatatus. 18 — Spartacus albatus. 19 — Strongylocoris stygicus. 20 — Lygus vanduzeei. (1-13 and 19-20, after Knight).

Plate I

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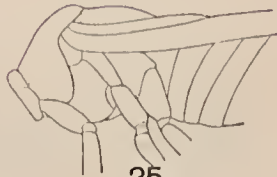
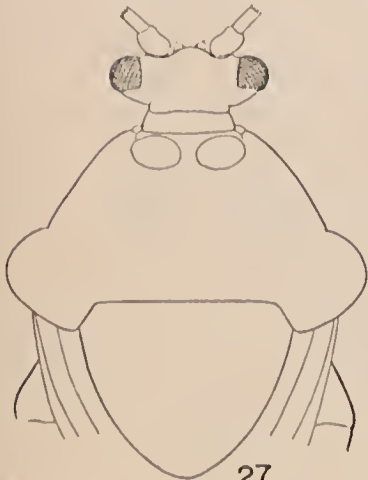
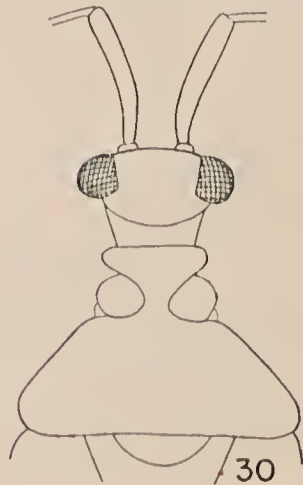
Plate II

21 — Unicellular membrane of Bryocorinae. 22 — Bicellular membrane of Mirini. 23 — Tarsus of Stenodema. 24 — Ostiolar peritreme of Resthenini (Prepops). 26 —Head and pronotum of Clivinemini (Ambracius). 27 — Head and pronotum of Odoniellini (Parabryocoropsis). 28 — Tarsus of Bryocorine (Neella). 29 — Tarsus of Mirinae (Horcias). 30 — Head and pronotum of Monaloniini (Poppiusia).

Plate II

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31 — Pronotal collar of Mirinae (Calocoris). — 32 — Depressed collar of Orthotylinae (Orthotylus). 33 — Head and pronotum of Phylini (Plagiognathus). 34 — Pronotal collar of Orthotylinae (Cyllecoris). 35 — Pronotum of Stenodemini (Leptopterna), showing the prominent lateral rigde characteristic of the Stenodemini (after Knight). 36 — Pronotal collar of Orthotylinae (Cyllecoris). 37 — Pronotum of Phylini (Conostethus). 38 — Head and pronotum of Mirini (Calocoris). 39 — Lateral view of Herdoniini (Guarania).

Plate III

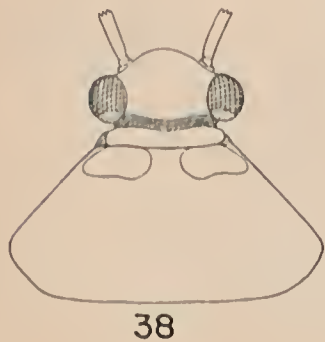
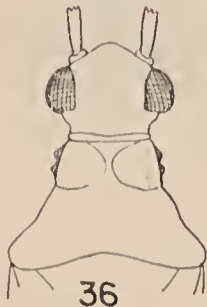
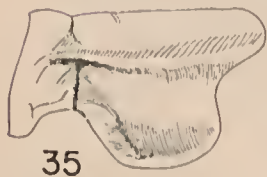
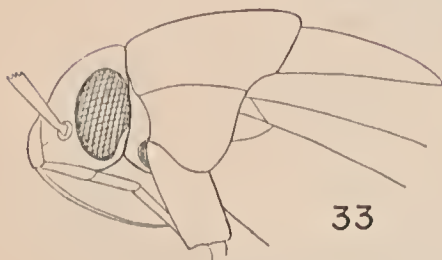
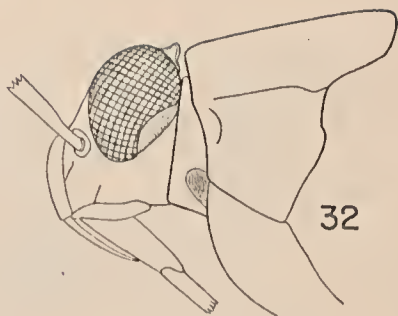
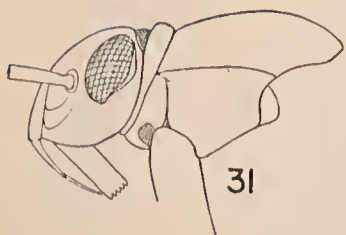



Plate IV

40 — Head of Orthotylini (Orthotylus). 41 — Pronotum and head of Fulviini (Fulvius), after Knight. 42 — Head and pronotum of of Dicyphini (Dicyphus). 43 — Head of Halticini (Halticus). 44 — Body of Mecistoscelini (Mystilus). 45 — Pronotum and head of Mirini (Horcias). 46 — Pronotum and head of Termatophylini (Termatophylum). 47 — Pronotum and head of Resthenini (Prepops). 48 — Head of Cylapini (Cylapus).

Plate IV

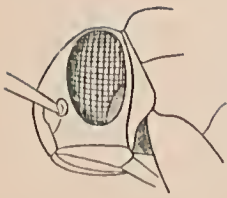
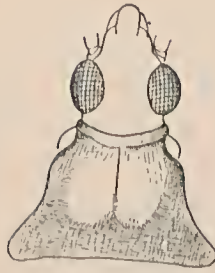
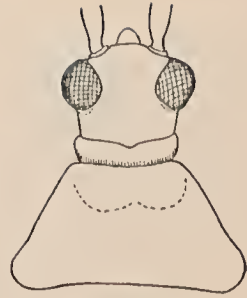
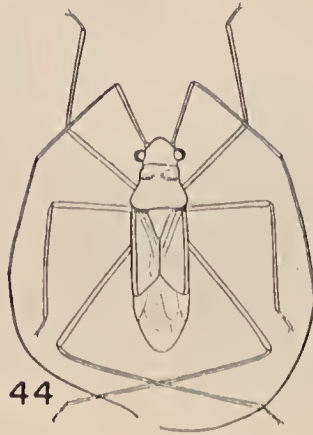
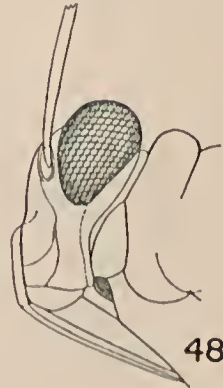
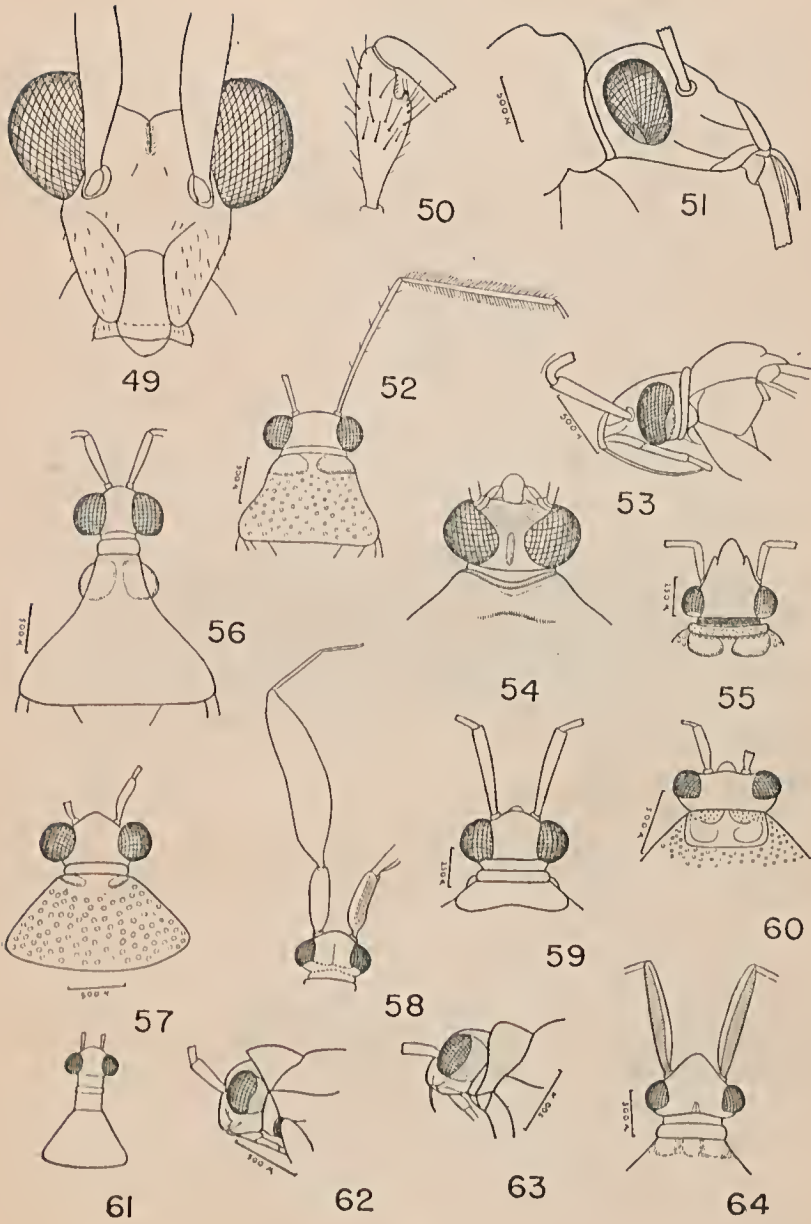



Plate V

49 — Cylapus tenuicornis Say, frontal view (Afeter Knight). 50 — First antennal segment of Odontocerocoris ornandus (Distant). 51 — Head of Rhinomiris camelus Poppius, side view. 52 — Head, pronotum and antennae of Annona bimaculata (Distant). 53 — Head of Fulvius bisbistillatus Stal, side view. 54 — Head of Eustictus Reuter. 55 — Head of Eurychilopterella lurida Reuter. 56 — Head and pronotum of Carijoanus ruberfasciatus Carvalho. 57 — Head and pronotum of Antias chilensis Carvalho. 58 — Head and antenna of Auchus brasiliensis Knight & Carvalho. 59 — Head and first antenna of Pseudocarnus fraudans (Stal). 60 — Head and pronotum of Guanabarea angrensis Carvalho. 61 — Head and pronotum of Trygo imitationis Distant. 62 — Head and pronotum of Ambracius dufouri Stal, side view. 63 — Head and pronotum of Guanabarea angrensis Carvalho, side view. 64 — Head and first antenna of Pseudocarnus Distant.

Plate V

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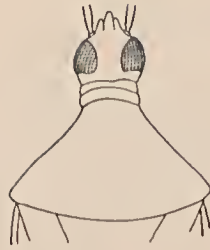
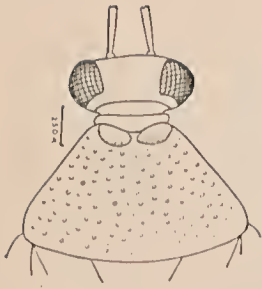
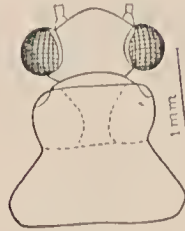
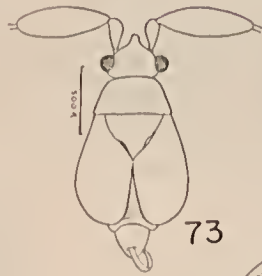
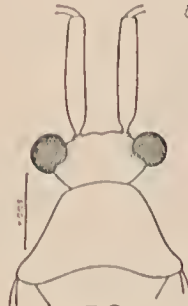
65 — Head and pronotum of Hyaliodocoris Knight. 66 — Head and pronotum of Fingulus atra (Hsiao). 67 — Megamiris vittatus Hsiao, seen from above. 68 — Head, pronotum and antenna of Hyaliodes vitripennis discoidalis Reuter. 69 — Claw and arolia of Parasthenaridea Miller. 70 — Head and pronotum of Trilaccus nigroruber Horvath. 71 — Head and pronotum of Termatophylidea pilosa Reuter & Poppius. 72 — Cuneus of Ofellus Distant. 73 — Tapuruyunus Carvalho, seen from above. 74 — Head and pronotum of Florus insolitus Distant. 75 — Hemielytron of Xenocylapus Bergroth. 76 — Head and pronotum of Hesperophylum heidemanni Reuter & Poppius (After Knight). 77 — Head and pronotum of Crassicornus Carvalho. 79 — Head of Campylomma verbasci (Meyer), side view. 80 — Head of Dolichostenia trigonalis (Signoret), side view.

Plate VI

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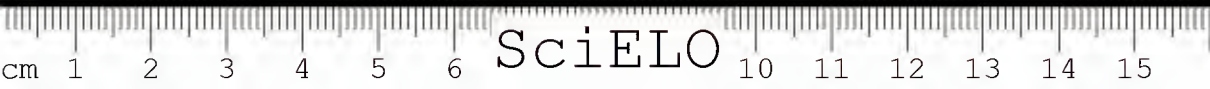
81 — Head of Sohenus uvarovi. 82 — Head of Atractotomus mali. 83 — Head of Piezocranum simulans Horvath. 84 — Pronotum of Nicostratus balteatus Distant. 85 — Head of Plagiognathus arbustorum (Fabricius). 86 — Head and pronotum Cyphopelta modesta Van Duzee. 87 — First antennal segment of Nasocoris Reuter. 88 — Head, pronotum and antennae of Ranzovius Distant. 89 — Second antennal segment of Harpocera thoracica. 90 — Hind femur of Campylomma breviata Knight. 91 — Tibia of Plesiodema pinetellus (Zetterstedti). 92 — Tibia of Plagiognathus arbustorum (Fabricius). 93 — Head and antenna of Anomalocornus Carvalho & Wygodzinsky. 94 — Cuneus of Allocotomus gothicus Fallen. 95 — Head of Megalocoleus molliculus. 96 — Head of Tuponia malgache Carvalho. 97 — Head and antenna of Spanogonicus albofasciatus (Reuter). 100 — Pronotum of Stenoparia putoni Fieber.

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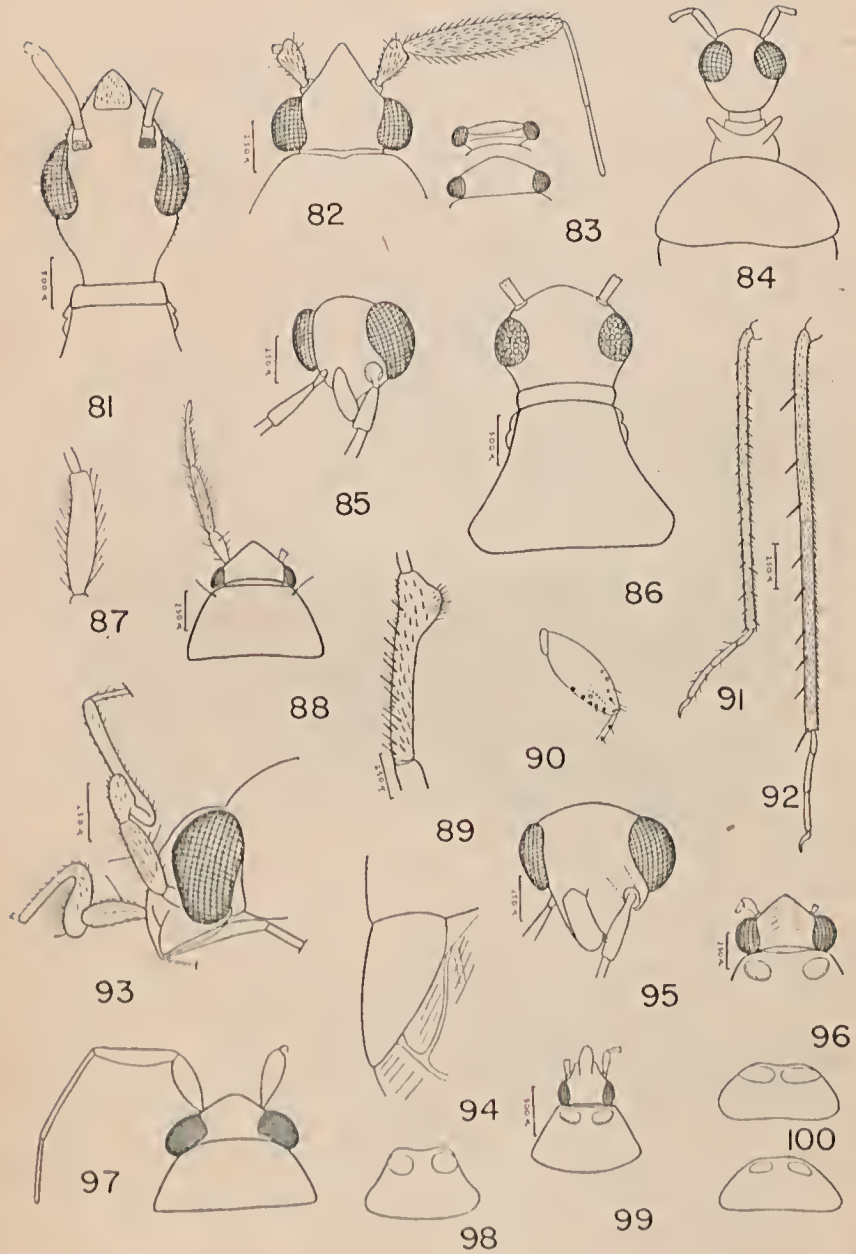
Plate VIII

101 — Head and antennae of Hyalochloria denticornis Reuter. 102 Antenna of Ceratocapsus modestus (Uhler). 103 — Antenna of Orthotylus fuscicornis. 104 — Antenna of Heterocordylus malinus Reuter. 105 — Hind tibia of Trigonotylus Fieber, to show pubescence. 106 — Head and pronotum of Semium hirtum Reuter, side view. 107 — Head of Platycranus erberi Fieber. 108 — Falconia tupiana Carvalho, seen from above. 109 — Head and pronotum of Pliniella sacerdotula Bergroth. 110 — Head and pronotum of Brasiliomiris ernestoi Carvalho. 111 — Head and antenna of Platytomatocoris brasiliensis Carvalho. 112 — Head and pronotum of Hadronema militare Uhler. 113 — Head of Ilnacora stalii Reuter, side view. 114 — Head and pronotum of Itacoris nigrioculis Carvalho. 115 — Head and pronotum of Jobertus esavianus Carvalho. 116 — Hemielytron of Ophthalmomiris Berg. 117 — Head and pronotum of Labopidea allii Knight. 118 — Head and pronotum of Rhinocapsidea genetiva (Distant). 119 — Parthenicus juniperi (Heidemann), head and pronotum.

Plate VIII

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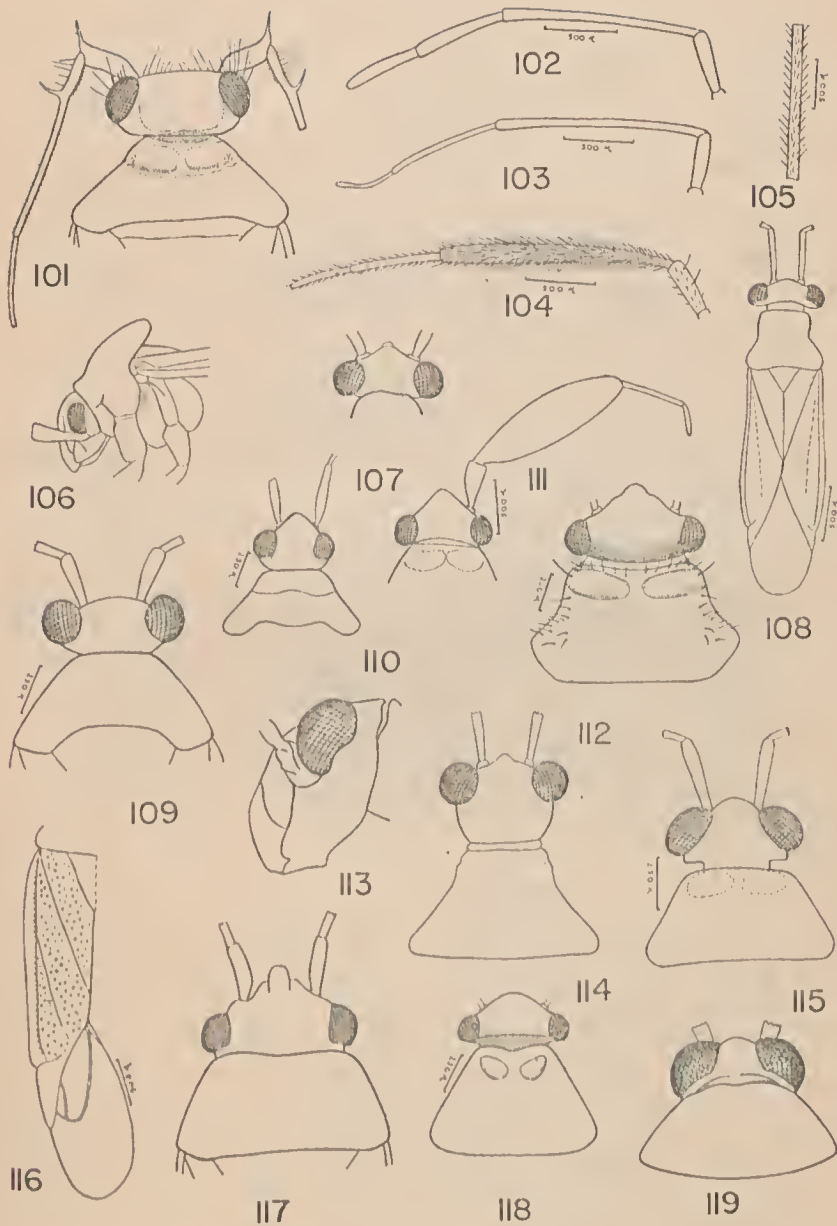
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120 — *Physophoropterella denticollis* Poppius, side view. 121 — *Physophoroptera mirabilis* Poppius, side view. 122 — *Parafurius discifer* (Stal), seen from above. 123 — Head of *Dichrooscoris malaisei* Carvalho. 124 — *Pantiliomorfa impressopunctata* Schumacher. 125 — Head and pronotum of *Stenopterocoris laticeps* China. 126 Head and pronotum of *Halticotoma valida* Reuter. 127 — Head and pronotum of *Sinervus hyalipedes* Carvalho. 128 — *Parabryocoropsis typicus* China & Carvalho, seen from above. 129 — Head and pronotum of *Pseudodoniella pacifica* China & Carvalho. 130 — Head and antenna of *Villiersicoris holasi* Delattre. 131 — Hemielytra of *Tenthecoris orchidearum* (Reuter). 132 — Head and pronotum of *Mecolaemus carvalhoi* (Costa Lima). 133 — Head and pronotum of *Cyrtocapsus caligineus* (Stal). 134 — Head of *Sysinas pallidipes* (Stål). 135 — Head of *Aspidobothrus flavicosta* Carvalho. 136 — Head of *Eurycipitia splendens* (Distant). 137 — *Coleopteromiris similaris* Carvalho, seen from above.

Plate IX

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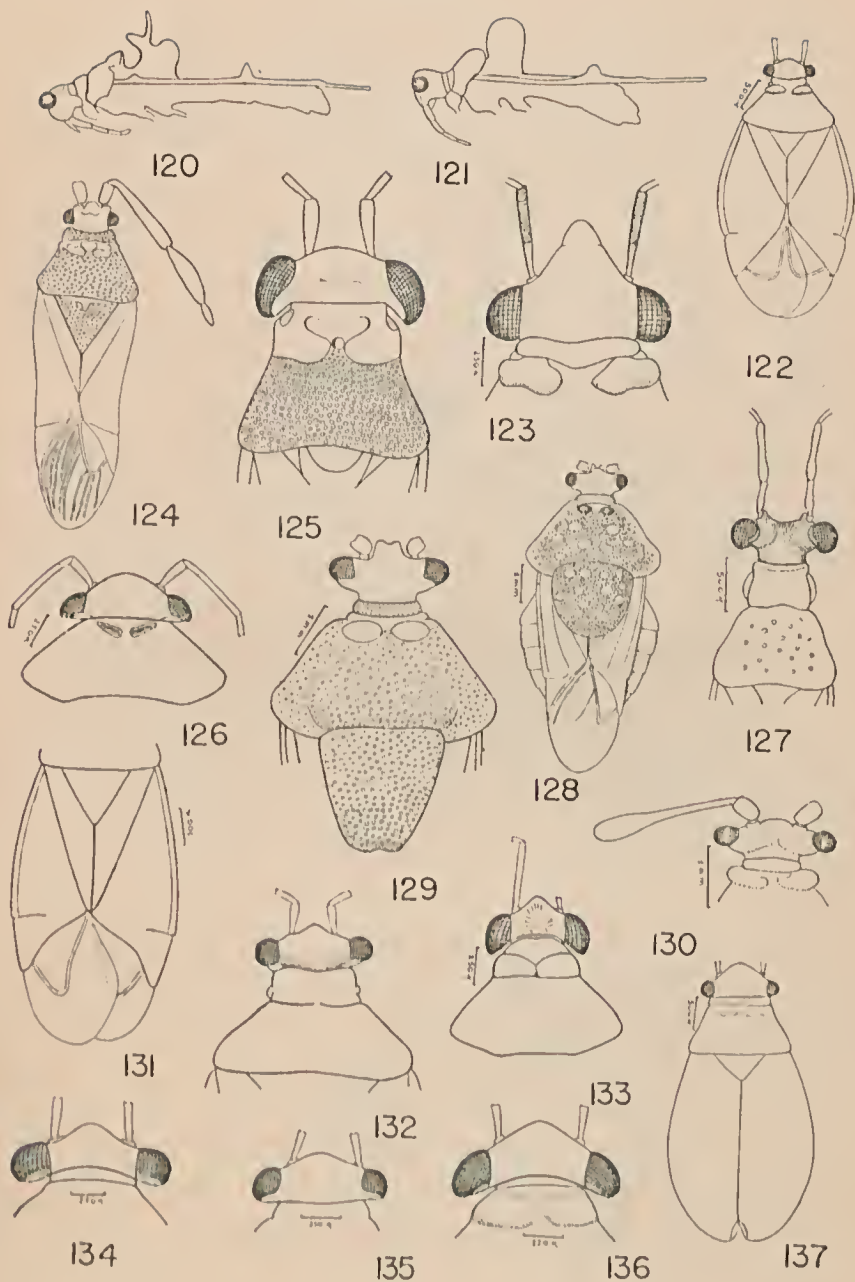
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138 — Head and pronotum of Monalonion xanthophilum Walker. 139 — Hemielytra of Poppiusia combretorum China. 140 — Head of Knightocoris Carvalho & China. 141 — Hemielytron of Spartacus albatus Distant. 142 — Head and pronotum of Bryocoris pteridis (Fallen). 143 — Head and pronotum of Caulotops puncticollis Bergroth. 144 — Head and pronotum of Stictolophus bicolor Carvalho. 145 — Tibia of Sahlbergella singularis Haglund. 146 — Hemielytron of Neoneella milzae Carvalho. 147 — Tibia of Distantiella theobroma (Distant). 148 — Head and pronotum of Pycnoderes 4-maculatus (Guèrin & Meneville). 149 — Hemielytron of Sinervus barensprungi Stal. 150 — Hemielytra of Neofurius Distant. 151 — Head and pronotum of Labops hirtus Knight. 152 — Hemielytron of Prodromus thaliae China. 153 — Hemielytron of Bothriophorella nigra (Stal). 154 — Head of Cyrtotylus rubricatus Bergroth, side view. 155 — Head and pronotum of Zanchius fragilis Usinger (After Usinger). 156 — Hemielytron of Metafurius Carvalho & China.

Plate X

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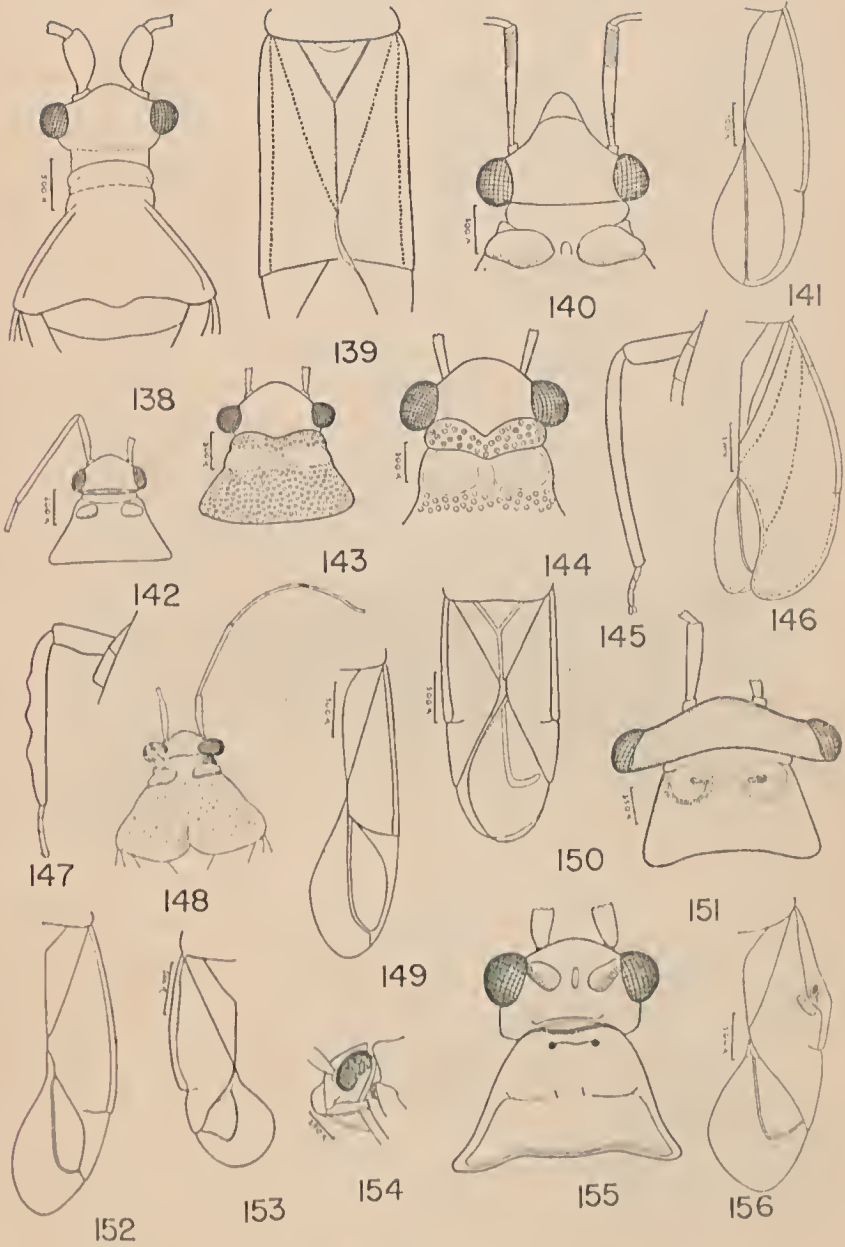
Plate XI

157 — Head and pronotum of Campyloneura virgula (Herrich-Schaeffer). 158 — Zikaniola elegans Carvalho seen from above. 159 — Scutellum of Helopeltis Signoret, side view. 160 — Head and pronotum of Onconotellus buxtoni Knight. 161 — Head and pronotum of Macrolophus nubilus (Herrich-Schaeffer). 162 — Head and pronotum of Apollodotidea y-signata Hsiao. 163 — Cuneus and membrane of Chius maculatus Distant. 164 — Head and pronotum of Felisacus ochraceus Usinger. 165 — Hemelytron of Heterocoris dilatatus (Guerin-Meneville). 166 — Head of Rhopaliseschatus Reuter. 167 — Head and pronotum of Cyrtopeltis modesta (Distant). 168 — Hemielytron of Emboliocoris Carvalho & China. 169 — Head and collar of Yamgambia macarangae (China). 170 — Head of Hesperolabops Kirkaldy. 171 — Head and pronotum of Neella lutescens (Stal). 172 — Head and pronotum of Monalocoris filicis (Linnaeus). 173 — Head and pronotum of Nototremates Carvalho & China).

Plate XI

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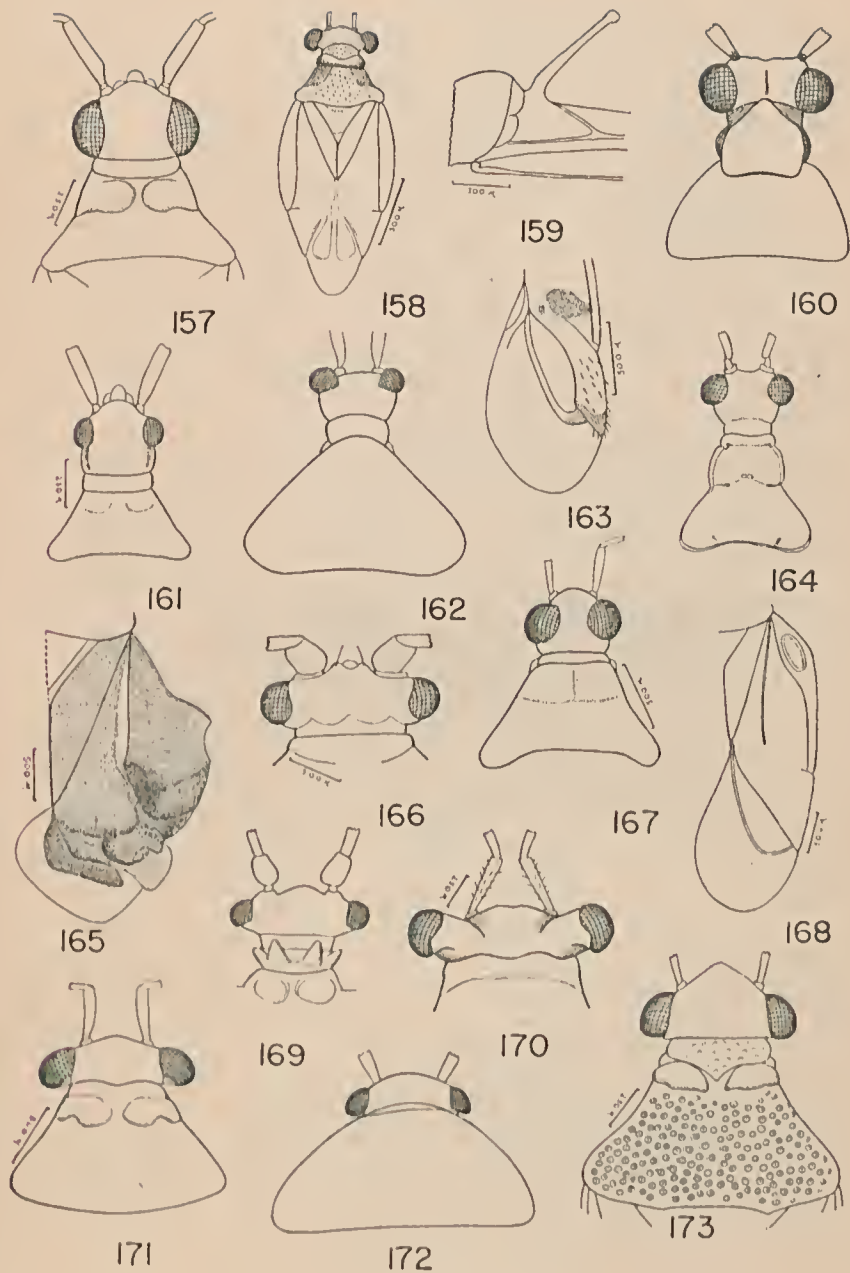
Plate XII

174 — Haed and pronotum of Collaria scenica (Stal). 175 — Head and pronotum of Leptoterna dolabrata (Linnaeus). 176 — Head and pronotum of Stenodema insuavis (Stal). 177 — Tibia of Fiebrigiella humeralis Poppius. 178 — Head and pronotum of Trigonotylus ruficornis (Geoffroy). 179 — Head and antenna of Garganus gracilentus (Stål). 180 — Head of Atomoscelis onustus Fieber, side view. 181 — Tibia of Ellenia cuneata (Stal). 182 — Head of Paredrocoris pectoralis Reuter. 183 — Head of Calondas fasciatus Distant. 184 — Head and pronotum of Teratocoris saundersi. 185 — Derophthalma minuscula Carvalho, side view of head and pronotum. 186 — Head of Hadrodemus m-flavum (Goeze). 187 — Head of Grypocoris costai Reuter. 188 — Head and pronotum of Pameridea marlothi Reuter. 189 — Scutellum of Chileaia Carvalho. 190 — Pronotum of Neoborus glaber Knight. 191 — Head and pronotum of Phyllopidea picta (Uhler). 192 — Head of Pantilius tunicatus (Fabricius). 193 — Head of Calocorisca villosa Distant. 194 — Head of Eubatas chiriquinus Distant.

Plate XII

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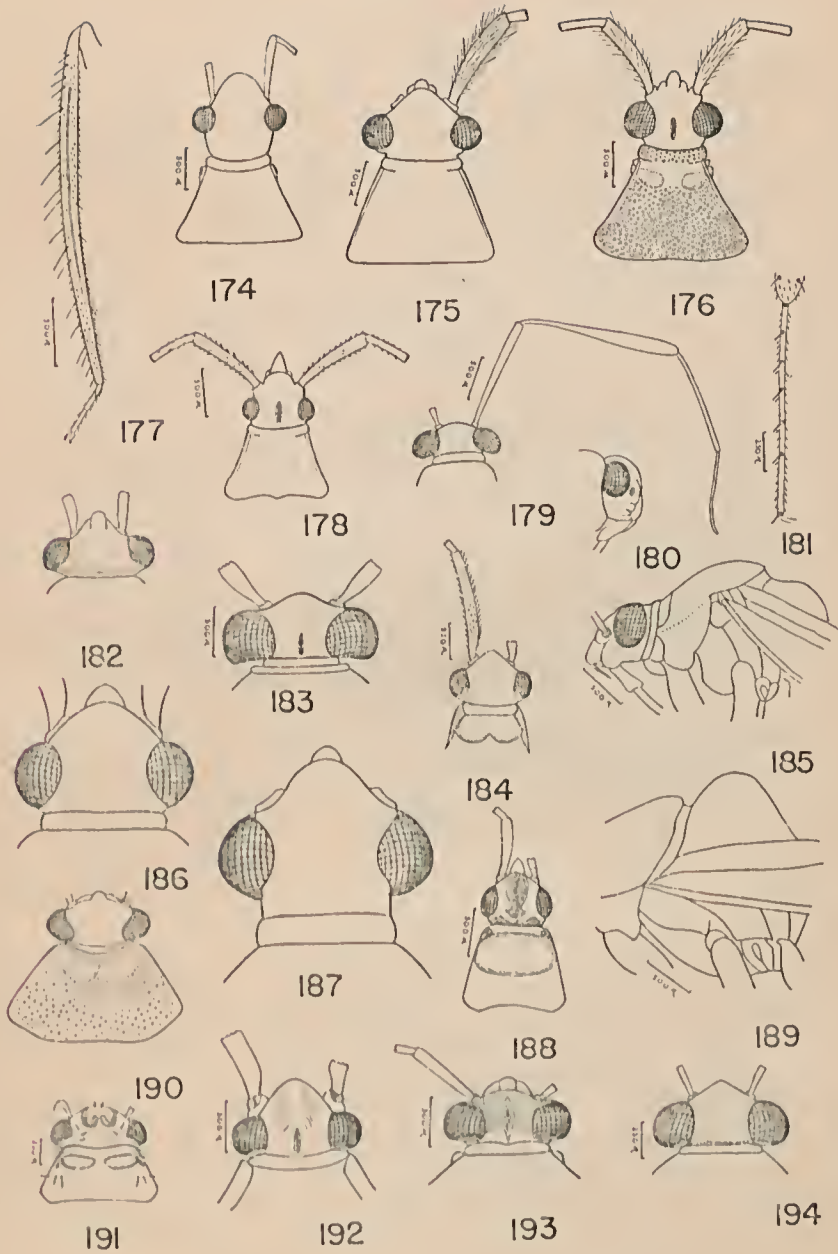


Plate XIII

195 — Head of Piasus cribricollis (Stal). 196 — Antenna of Pachymerocerus erythronotus (Berg). 197 — Head and antenna of Capsus ater (Linnaeus). 198 — Head and antenna of Creontiades Distant. 199 — Guianella marmorata Carvalho, seen from above. 200 — Head and first antennal segment of Clapmarius Distant. 201 — Head, pronotum and antenna of Sidnia kellersi Knight 202 — Head and antennae of Eurotas nodosus Distant. 203 — Head and first antenna of Pocas reuteri Distant. 204 — Head and pronotum of Plesiolygus punctatus Knight. 205 — Head and pronotum of Monalocorisca conspurcata Distant. 206 — Head, pronotum and antenna of Lygidea mendax Reuter. 207 — Head and pronotum of Taedia neotropicalis Bergroth. 208 — Head, pronotum and antenna of Lygus (Neolygus) communis Knight. 209 — Head, collar and first antenna of Mabelia pulcherrima Kirkaldy. 210 — Pronotum of Tinginotopsis Poppius. 211 — Head and first antennal segment of Lampethusa anatina Distan. 212 — Head of Hyporrhinocoris tomentosus Reuter, side view.

Plate XIII

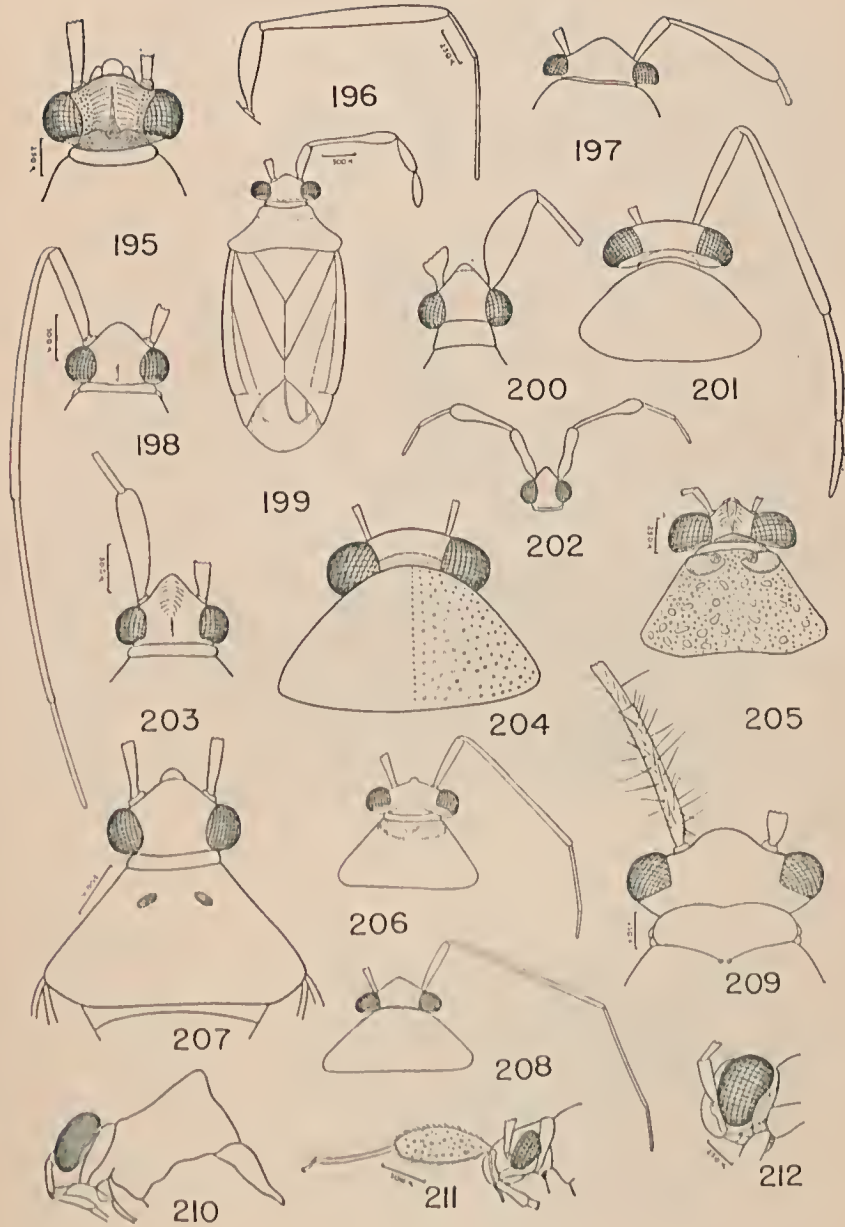
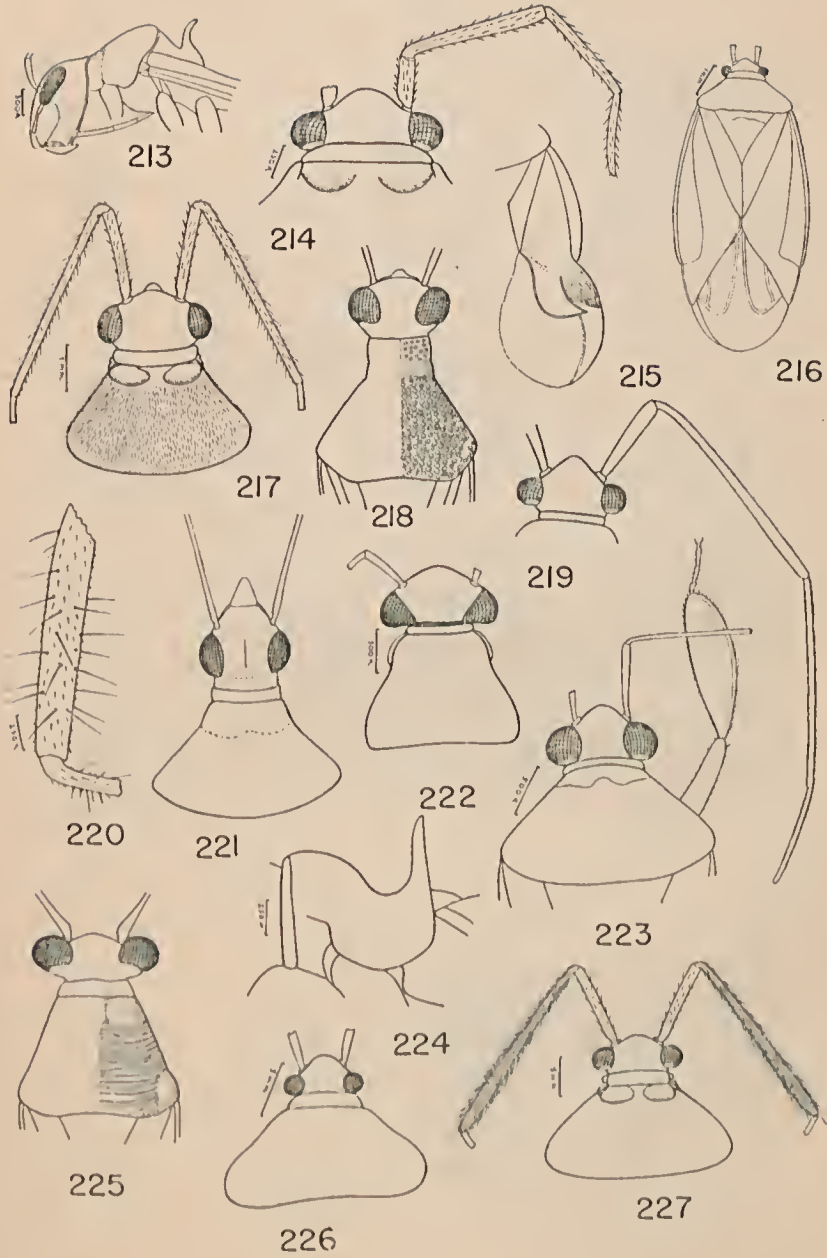



Plate XIV

213 — Head and pronotum of Herdonius armatus Stal, side view. 214 — Head and first antennal segment of Onceronetopus impictus Knight. 215 — Hemielytron of Angerianus fractus Distant. 216 — Euryscytophora laterallis Reuter, seen from above. 217 — Head, pronotum and antennae of Platytyllus Reuter. 218 — Pronotum and head of Macrolonidea cyanescens Hsiao. 219 — Head and antenna of Adelphocoris lineolatus (Goeze). 220 — Hind femur of Paraxenetus guttulatus (Uhler). 221 — Head and pronotum of Kiambura coffeae China. 222 — Head and pronotum of Haarupia spinosa Poppius. 223 — Head, pronotum and first tibia of Henicocnemis alboornatus Stal. 224 — Pronotum of Dacerla inflata (Uhler). 225 — Pronotum of Euhyalopeplus pulchellus Hsiao. 226 — Head and pronotum of Chiloxianotus nigroscutellatus Carvalho. 227 — Pronotum, head and antennae of Platytyllus Fieber.

Plate XIV

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228 — Head and pronotum of *Ucleana longicuneata* Carvalho. 229 — Head and pronotum of *Myombea* China & Carvalho. 230 — Antenna of *Druthmarus* Distant. 231 — Head and pronotum of *Aztecariella* Carvalho. 232 — Upper side of *Peritropis saldaeformis* Uhler. 233 — Head of *Schoutedenomiris* Carvalho, side view. 234 — Head of *Lopidea* Uhler, side view (after Knight). 235 — Head and pronotum of *Ranzovius* Distant. 236 — Head of *Acrorrhinium* Noualhier, side view. 237 — Head and pronotum of *Kunungua* Carvalho. 238 — Head and antenna of *Neurocolpus tiliae* Knight. 239 — Head of *Chamus tuberculatus* (Distant). 240 — Head, pronotum and antenna of *Halticus bracteatus* (Say). 241 — Head and pronotum of *Malgacheocoris* Carvalho. 242 — Head and pronotum of *Setocoris* China & Carvalho. 243 — Head and pronotum of *Paulianana* Carvalho. 244 — Head of *Vannius* Distant.

Plate XV

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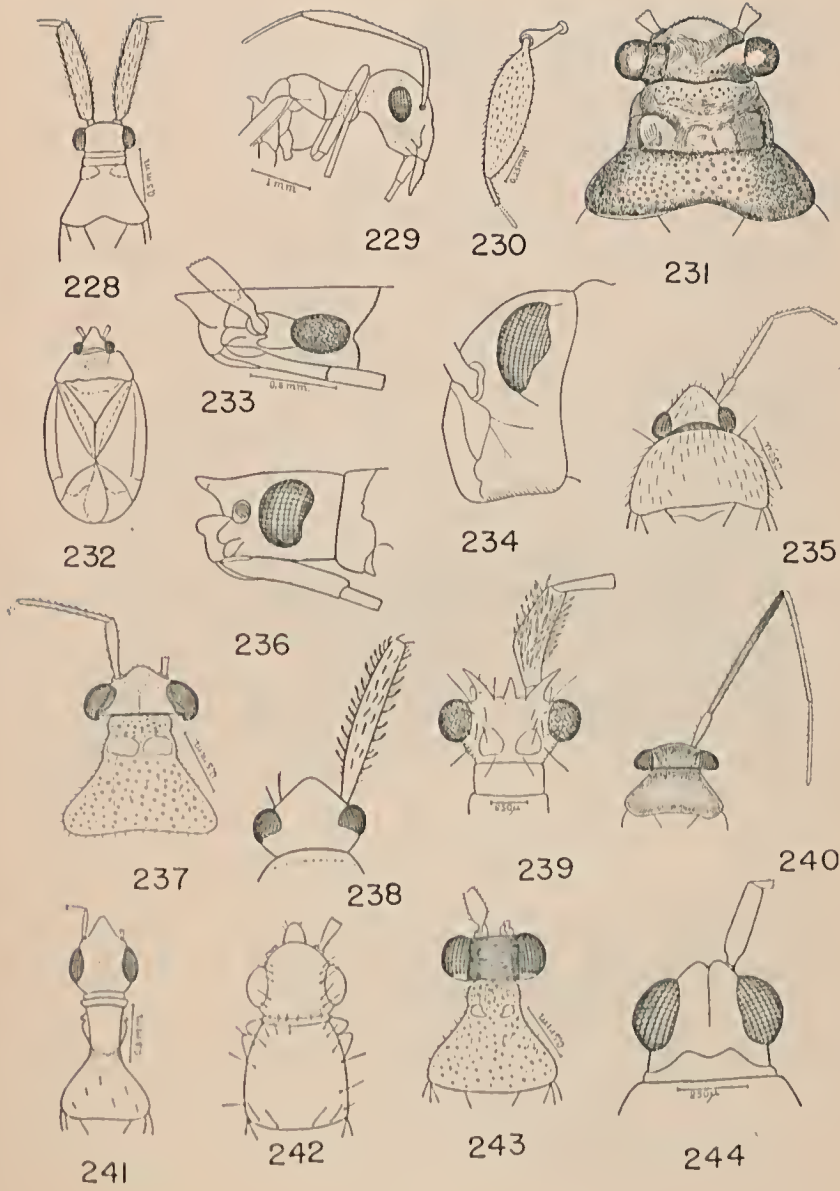
Plate XVI

245 — Head and pronotum of Paracylapus Carvalho. 246 — Head and pronotum of Yebonia Carvalho. 247 — Pronotum of Zacynthus Distant. 248 — Head of Eurychilella Reuter. 249 — Pronotum of Callichila Reuter. 250 — Scutellum of Knightonia, lateral view. 251 — Head and pronotum of Mimoncopeltus Kirkaldy. 252 — Head and pronotum of Zacynthus (after Distant). 253 — Head of Fuscus Distant. 254 — Head and pronotum of Myrmecoris Gorski. 255 — Head and pronotum of Camponotidea Reuter (after Hoberlandt). 256 — Head and pronotum of Hallodapoides Carvalho. 257 — Head and pronotum of Cysteorracha Kirkaldy. 258 — Head and pronotum of Peruanocoris Carvalho. 259 — Head of Hadronema Uhler (after Knight). 260 — Head, pronotum and scutellum of Resthenia Spinola. 261 — Head and pronotum of Pilophorus Westwood. 262 — Head and pronotum of Pseudoxenetus Reuter. 263 — Head and pronotum of Diaphnidia Uhler.

Plate XVI

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